

Potash Deliveries Increase About 3% Over 1955 Figure

API Reports First
Nine Months of 1956
Ahead of Last Year

WASHINGTON, D.C.—During the first nine months of 1956, total deliveries by United States potash producers and importers amounted to 1,781,593 tons of potash salts containing 1,642,637 tons K_2O , an increase of less than 3% in salts and K_2O over the corresponding period in 1955, according to the American Potash Institute.

Potash for agricultural use in the United States, Canada, Cuba, Puerto Rico, and Hawaii amounted to 1,439,032 tons K_2O contained in 2,446,066 tons of salts of which 2,222,485 tons were muriate of potash, 6,870 tons manure salts, and 216,711 tons sulphate of potash and sulphate of potash-magnesia. This represents a decrease of 1% in salts and K_2O , the API points out. Deliveries to the chemical industry totaled 154,563 tons of muriate of potash and sulphate of potash, containing an equivalent of 96,054 tons K_2O , an increase of 13% in salts and K_2O over 1955. Exports outside of North America amounted to 190,964 tons of salts, containing an equivalent of 107,551 tons K_2O , an increase of 77% in salts and 74% in K_2O over the same period in 1955.

The seven major American potash producers delivered 688,143 tons of potash salts containing an equivalent of 406,095 tons K_2O during the third quarter of 1956, an increase of 5% in salts and K_2O over the same period in 1955. Agricultural deliveries in the United States, Canada, Cuba, Puerto

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Work Starts on Lion Oil Co. Nitric Acid Plant in Arkansas

EL DORADO, ARK.—Construction has begun on a nitric acid concentrator at the El Dorado chemical plant, according to an announcement by T. M. Martin, president of Lion Oil Co., division of Monsanto Chemical Co.

The addition, which represents a substantial investment, will concentrate 58% nitric acid now being manufactured at two existing units. It is expected to produce, under normal operation, 40 tons per day of nitric acid of 95% strength, which will be used primarily as a raw material by another Monsanto plant. Included in the construction will be blending facilities which will also permit the production of 68% nitric acid.

The new unit will be housed in a steel framework, equivalent in height to a four-story building.

Construction contractor and designer of the installation is Chemical and Industrial Construction Co., a subsidiary of Chemical and Industrial Corp. of Cincinnati, Ohio. Completion is scheduled for March, 1957.

Output of Fertilizer Materials Up First Six Months of 1956

WASHINGTON, D.C.—Production of various chemicals used in agriculture is reported by the U.S. Department of Commerce in its monthly summary of the chemical and rubber industries. The report, issued by the business and defense services administration of the commerce department, described the fertilizer industry as undergoing its normal seasonal upturn for autumn. "However, stocks of many of the materials as well as of finished goods were apparently at higher levels at the end of the summer season than they were a year ago," it adds.

The report states, however, that "the declines in production of nitro-

genous materials and superphosphates were not as drastic during the past summer as they were last year, which probably accounts in part, for the increase in stocks. The outlook for improvement in farm income and the soil bank program are factors which favor better fertilizer demand during the coming year. However, with capacity of some products still expanding, individual suppliers may find that

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New York Group in Session This Week

ITHACA, N.Y.—The eighteenth annual New York State Insecticide and Fungicide Conference and the ninth annual Pesticide Application Equipment Conference will be held here Nov. 13-15. The three-day meeting headquarters was Bibbins Hall, Grange League Federation, Ithaca.

The advance program indicated that papers would be presented on many entomological subjects, including discussions on toxic residues, application equipment, resistance of insects, and formulation problems.

Reports on fungicidal studies on various fruits were on the agenda as were discussions on nematode control and a review of pest control work of the cooperative Cornell University-Philippines project conducted at Los Banos, Philippines.

Recommendations for the control of various pests in 1957 were also to be given at the meeting. These included recommendations for fruit insect pests; livestock insect control; vegetable disease control; potato disease control; forage crops insect control; vegetable insect control and insect and mite control on woody ornamentals.

An address of welcome to the industry members was to be given by Dr. S. S. Atwood, provost, Cornell Univ., and various faculty staff members from the university were to act as chairmen of different sessions in the three-day meeting.

Farmers Tell Canadian Group Why They Use or Fail to Use Chemical Products on Crops

NIAGARA FALLS, ONT.—Featuring panel discussions on extension and talks on the long-term outlook for the use of pesticides and other chemicals for farm use, the Canadian Agricultural Chemicals Assn. held its fourth annual meeting and conference at the Sheraton Brock Hotel, Niagara Falls, Ontario. Dates of the meeting were Oct. 16-18.

Both pros and cons of utilizing agricultural chemicals on the farm were

covered in the papers presented at the convention. One farmer, W. A. Thomson, Pense, Sask., Canada, explained why he and many other farmers do not make full use of chemicals in their operations.

As a background to his remarks, Mr. Thomson reminded the group that the farmer of today must be a first class businessman to handle wisely and successfully a large capital investment. This, he said, is quite in contrast to the situation of a few years ago when farming on the prairies was an occupation "in which reasonable success could be attained with a small capital investment and the will to work."

That day is gone now, he said, and now the farmers are confused in trying to keep up with both technical and economic developments. Contributing to this confusion, he said, is the fact that various sources of information concerning the use of chemical aids, are not uniform. Conflicting recommendations leave an area of uncertainty and lack of confidence.

Along this same line, advances made in the production of new chemicals for agriculture are getting far ahead of the extension specialist and the farmer, with the result of more confusion, he said.

Mr. Thomson told the group of pesticide makers also that herbicides now available to the farmer are "too selective" and that they would find broader use if they gave "a measure of control to the more resistant weeds."

One of the most profound answers

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Need to Expand Markets Is Underlined at AAI Meeting

By HENRY S. FRENCH
Croplife Editorial Staff

ATLANTA, GA.—Expanding efforts to broaden markets for anhydrous ammonia are needed to keep pace with production developments and to induce growers to use adequate amounts, program speakers emphasized at the sixth annual convention of the Agricultural Ammonia Institute, held at the Biltmore Hotel here, Nov. 7-9.

More than 500 anhydrous ammonia producers, distributors and equipment manufacturers from 38 states and Canada heard Maj. General Ralph H. Wooten, Mid-South Chemical Corp., Memphis, Tenn., retiring president of the AAI, urge greater educational efforts to increase the use of NH_3 . In 1950, when the institute was organized, he said, only five or six firms produced anhydrous ammonia for agricultural use. Now there are more than 40

producers and for the first time in history, the nitrogen supply exceeds demand.

The retiring AAI president pointed out that American farmers have increased tremendously their use of nitrogen since 1950. "This increase has resulted both from more farmers using nitrogen as a fertilizer and also from the heavier rates of application per acre," he said. The AAI, he added, in its promotion of greater use of ammonia nitrogen, has incidentally developed a greater interest in the use of all types of fertilizers, and particularly in the increased applications of the three ingredients nitrogen, phosphate and potash. "During the past six years the use of ammonia for direct application as a source of nitrogen has grown from 7% of the total N used to

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Wilson & Geo. Meyer Shifts Personnel to Fit Market Expansion

SAN FRANCISCO, CAL.—Promotions and transfers of personnel to keep pace with expanding demand for agricultural chemicals in the West have been announced by Ralph S. Waltz, vice president and manager of agricultural chemical sales, Wilson & Geo. Meyer & Co., San Francisco. All changes became effective Nov. 1.

Philip A. Sawyer, of the Los Angeles office staff, has been promoted to assistant manager, agricultural chemical sales, Southwest territory. He will assist John M. Hooper, recently transferred from the firm's Portland office, to be in charge of Southwestern territory agricultural sales.

Richard T. Swanson, Jr., a graduate of the University of Cali-

fornia's college of agriculture, has been transferred from the San Francisco office to the Los Angeles office to take charge of peat moss sales there.

Donald Deggendorf, who until recently was in agricultural chemical and specialty sales work in the Midwest, has joined the agricultural chemical sales staff in the San Francisco office.

Leland Oberholser, who has been active in sales work since his graduation from the University of California college of agriculture, has joined the agricultural chemical sales staff and has been assigned to the Los Angeles office.

Wilson & Geo. Meyer & Co. is Western sales representative for a number of agricultural and industrial chemical products including Stauffer Chemical Co. and Western Phosphates, Inc., phosphate fertilizers; Norsk Hydro, Norwegian calcium nitrate and urea; Western Peat Co., Ltd., Canadian peat moss products;

and Wasman Chemical Products, Inc., chemicals and plastics. The firm has its headquarters in San Francisco and district offices in Los Angeles, Phoenix, Fresno, Portland, Seattle, Spokane, Salt Lake City, Denver and Omaha.

Kentucky Seeks Site for Agricultural Research

LEXINGTON, KY. — Gov. A. B. Chandler of Kentucky has indicated that a new site is being sought for the location of the University of Kentucky's agricultural research operations. The governor told the Fayette County Farm Bureau recently that the proposed site would be some 1,100 acres in size.

The university also needs, and according to the governor, "is going to get," a basic sciences building which he hopes will be ready about the time the university's new medical school opens in 1959.



E. Russell Rouzer

Manager for Liquid Fertilizer Plant Named

BALTIMORE, MD. — E. Russell Rouzer, former district manager for Miller Chemical and Fertilizer Corp. at Hanover, Pa., has been named to the post of Technical Supervisor of Liquid Fertilizers. Mr. Rouzer has been with Miller since 1947 and has played an important part in establishing the firm's plant at Hanover, Pa.

Mr. Rouzer's work will include promotion and development of liquid fertilizers for ground application to all types of crops. The Miller company is one of the first in the East to market liquid fertilizers. Mr. Rouzer will coordinate research work and practical use to help growers determine the most effective and economical uses of liquid fertilizer. He plans to make his headquarters at Hanover.

Rail Employees Ask Weed Control to Get On the Right Track

COLUMBUS, OHIO—Railroad employees, irked at "unsafe and hazardous" working conditions caused by weeds growing beside the tracks, have taken action with the Ohio Public Utilities Commission to have the condition improved.

As a result, every railroad in Ohio must answer the complaints made by the unions. The transportation brotherhoods and maintenance of way employees says the situation has existed for years. The unions said the weeds created "unsafe and hazardous" working conditions.

"These conditions have been brought to the attention of the railroads operating departments on many occasions without improvement," the unions told the commission.

If the P.U.C. is not satisfied with answers by the railroads by Nov. 30, public hearings on the complaint will be scheduled.

Emulsol Names A. O. Raven In Sales Manager Post

CHICAGO, ILL.—Arthur O. Raven has been appointed sales manager of the Emulsol Chemical Corp., a division of Witco Chemical Co., the firm has announced.

Formerly assistant sales manager, Mr. Raven joined Emulsol 3 years ago as sales office manager and assistant to the executive vice president. Previously he had been a technical sales representative for Abbott Laboratories.

After graduating from the Illinois Institute of Technology with a B.S. degree in biochemistry, Mr. Raven studied business administration at the graduate school at Northwestern University.



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INDUSTRY MAN SPEAKS OUT . . .

Sees Small Benefit to Trade if Fertilizer Guarantees Go From Oxide to Elemental Base

By W. F. Price*

Swift & Company Plant Food Division
Chicago, Ill.

Expressing one's viewpoint on the controversial subject of the elemental vs. oxides in plant food guarantees may seem a little on the foolhardy side, but nevertheless I have a deep conviction that all angles of this important proposition have not been thoroughly considered. It should be emphasized, however, that both the choice of subject and the views expressed herein are those of the speaker, personally. They do not presume to represent the attitude of the entire plant food industry, nor are they expected to be the final word on the subject.

The speaker does hope, however, to contribute some thoughts that will be helpful to all parties in bringing the proposition into sharper focus.

Admittedly, it would be much easier for me to stand before the control officials and join with others in explaining why the oxides should be reduced. But if I should fail to counsel with you on some of the less thoroughly discussed problems involved in making this change, I would not only be untrue to myself but I would do a grave injustice to many of my friends and competitors in the fertilizer industry, who vigorously oppose this change.

Everything must have a beginning—someone must motivate and cultivate an idea to start it on its road to life. I wouldn't know just who should be handed first credit on the "elemental" idea. I recognize that this proposal has been "kicked around" in this country for at least thirty years and that the change has actually been made in at least one European country (Norway) whose fertilizer practices are entirely different from our own. It is my understanding that another European country (Sweden) attempted to make the change fifteen years ago. I say "attempted" because I understand that it is still necessary to use both the oxides and the elements in expressing fertilizer guarantees there.

I would be the first to admit that phosphorus and potassium should have been expressed in the elemental form when the plant food nutrients first sought expression over a hundred years ago. The question which has to be answered today is not whether this historical change can be made. Certainly it can be made, but is there sufficient unanimity among all the groups affected so that the change can be made without causing a chaotic condition?

Like any historical event, this matter of changing plant food guarantees to the elemental basis would not necessarily affect all concerned with equal benefit. You and I both have seen the list of pros and cons, and I am not going into a recitation of them here. It would be the job of control officials to administer and enforce the provisions of this proposal should it become law. The chief concern, then, in reaching a decision as to whether or not this measure merits the support of control officials is in determining how great the benefits will be—and to whom.

"To whom" is so important it will pay to take a fast look at "what" started the present elemental ball rolling. Back in 1951, at a meeting of the agronomy heads from colleges in the North Central states, the soil

scientists drafted a resolution recommending the discontinuance of the practice of expressing phosphorus and potassium contents of fertilizers in terms of the oxides. They then directed the resolution to all national, regional, and state agencies everywhere who had anything to do with fertilizers.

Admittedly, in agronomic research and teaching, as well as in fertilizer control calculations and nomenclature, an elemental basis for plant food guarantees would, of course,

simplify terminology and make the work of the scientists easier in that respect. In the interpretation of soil analytical data, they no longer would have to multiply by 2.29 or 1.20 to change P and K determinations to P_2O_5 and K_2O . To be sure, there are other advantages which undoubtedly had a bearing on their recommendation.

But in the list of "pros and cons" presented to the Soil Science of America and the American Society of Agronomy by their fertilizer committee, there are just three advantages listed:

1. Uniformity of terminology
2. Simplicity of expression
3. Accuracy.

A good salesman knows the value of parading "appeals" in his presentation. I've always said a good agronomist must be a good salesman. He has to be to sell the product of his effort. Thus those three simple advantages: uniformity, simplicity, and accuracy, become important appeals

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that elicit favorable response. And why not? Any agronomist worthy of his name wants the benefit in his daily work of uniformity, simplicity, and accuracy.

And so on the strength of uniformity, simplicity, and accuracy, the American Society of Agronomy in 1955 by a margin of 18 to 1 voted to endorse the change-over. Since then, endorsement has been received from the soil and fertilizer research committees, experiment station policy committee, and the Southern Fertilizer Control Officials.

According to my understanding, only a small percentage of the groups contacted with the original resolution have as yet endorsed this proposal. Naturally, I am not familiar with the survey results, but it should be kept in mind that they come from scientific groups. Endorsements from scientists or administrators, while extremely important, are still from

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*From talk presented before the American Assn. of Fertilizer Control Officials, Shoreham Hotel, Washington, D.C., Oct. 19, 1956.

WASHINGTON WIRE

Election Indicates No Change in Farm Policy

By JOHN CIPPERLY

Croplife Washington Correspondent

WASHINGTON—The Eisenhower landslide appears to have assured the present administration of national—and particularly farm belt—approval of the farm program which has been led by Ezra Taft Benson, Secretary of Agriculture. This seems to assure the re-appointment of Mr. Benson to the cabinet when the new Eisenhower administration takes over next January.

This points up the likelihood of no major changes being made in the farm policy of the present administration for the next few years.

The vote results in the farm states

failed to indicate any major revolt among the farmers in the Great Plains States or the Corn Belt. On the contrary, the Farm Belt election returns indicate support of Secretary Benson.

At this time it seems that the Democrats have failed to make any substantial gains in the House.

In the Senate it looks like the new Congress will show the same division with the Democrats in control by a 49-47 margin. Yet it must be noted that the new division does not indicate any change from the composition of the last Congress.

While the Republicans have lost certain seats, they have gained in other areas which on balance probably will not affect the Senate approach to the farm problem to any appreciable degree.

In the House election returns, the Democrats do not seem to have made any advances. On the contrary, at this time it appears that they have lost some of their earlier majority.

This should add to the supposition that there will be no major changes in legislation at the next session of the new Congress which may affect the chemical industries in the agricultural field.

DELAWARE MEETING PLANNED

NEWARK, DEL.—The Seventieth annual meeting of the Peninsula Horticultural Society will be held at Capital Grange Hall, Dover, Del., Dec. 11 and 12, 1956, according to James Richardson, president. The two-day program will include all the latest research of interest to fruit and vegetable growers.

R. W. Winters Appointed To Crag Sales Post

NEW YORK—Robert W. Winters has joined the Crag Agricultural Chemicals sales department of Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp. Mr. Winters' appointment as technical representative was announced by Dr. R. H. Wellman, department manager.

This appointment is the most recent step in Carbide's continuing, long range plan of expansion in the manufacture and distribution of Crag Agricultural Chemicals, Dr. Wellman explains.

Previously, Mr. Winters was employed as a high school teacher in the public schools in Michigan. He received the degree of master of science from Michigan State University in 1951, where he specialized in agricultural economics. In 1950 he was graduated Magna Cum Laude from Central Michigan College where he received his bachelor of science degree in agriculture.

USDA Moves to Prevent Spread of Gypsy Moth Via Christmas Trees

WASHINGTON, D.C.—The U.S. Department of Agriculture has reminded dealers and the public that, because of the gypsy moth, Christmas trees and evergreen boughs from the states of Connecticut, Rhode Island, Massachusetts, most of New Hampshire and Vermont, and numerous counties in Maine and eastern New York, require Federal inspection and certification before they are moved to areas not infested by this forest insect.

Reason for the inspection is that Christmas trees and greens may carry over-wintering, buff-colored egg clusters of the gypsy moth, which could be the source of new infestations of this destructive pest of forest, shade, and fruit trees. Gypsy moth caterpillars devour tree leaves and can defoliate entire forests. The insect destroys about \$1 million worth of trees a year.

The Department asks the public to cooperate in preventing spread of the moth and urges all shippers to secure certification of trees and greens at loading points, where it can be done without delay.

Inspectors of the USDA and the states, stationed throughout the gypsy-moth quarantine area, will furnish detailed information to Christmas-tree shippers on quarantine regulations and the scheduled certification at loading sites. These inspectors may be located by consulting U.S. post offices, agents of common carriers, or county agricultural extension agents, or by reference to telephone directories of towns and cities in the quarantine area, USDA says.

Iowa State Names New Science Dean

AMES, IOWA — Dr. Richard S. Bear, 48, professor of biophysics at Massachusetts Institute of Technology, has been named dean of the division of science at Iowa State College, according to President James H. Hilton.

The new dean is recognized as an outstanding scientist in chemistry whose special fields have been the application of that science to physics and biology. The position of science dean has been vacant since last spring when Dr. H. V. Gaskill resigned to accept a position in industry. Since that time Dr. J. A. Greenlee has served as acting dean. Dr. Bear was recommended to the college administration by a faculty committee which has been investigating possible candidates for the past several months.



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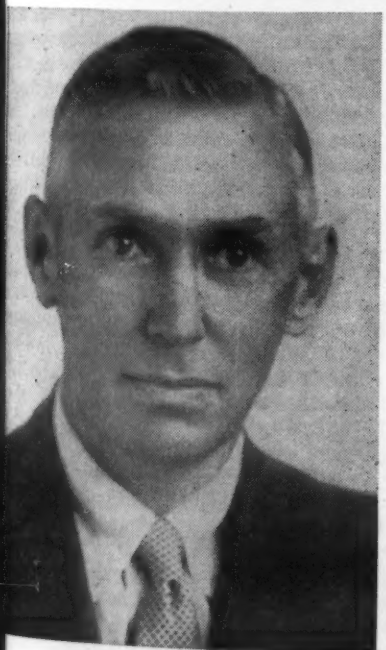


F. Edward Smith, Jr.

NEW PCA APPOINTEE—The Potash Company of America has recently announced the appointment of F. Edward Smith, Jr., as assistant to the vice president in charge of sales. Mr. Smith will make his headquarters at the company's general sales offices, 1625 Eye St., N.W., Washington, D.C. With the firm since January, 1938, Mr. Smith has been handling sales in the northeastern and Canadian territory. He is a graduate of the University of Maryland, and a native of that state. Before joining PCA, he was with the Read Phosphate Div. of Davison Chemical Co., at Charleston, S.C.

SOCIAL EVENTS PLANNED

NEW YORK—Salesmen's Association of the American Chemical Industry has set the dates for two of its major social events, according to H. D. Watson of Olin Mathieson Chemical Corp., chairman of the SAACI entertainment committee. The annual dinner dance will be held Nov. 16 at the Waldorf-Astoria and the annual Christmas party will be Dec. 12 also in the Waldorf-Astoria.



H. V. Kindseth

RESEARCH DIRECTOR—H. V. Kindseth, in charge of physical research in Minneapolis for Bemis Bro. Bag Co., has been appointed director of research for the company. Mr. Kindseth joined Bemis in 1931 and worked on the development of the bag packing machinery and equipment produced by the Bemis Packaging Service Plant, Minneapolis. He was appointed chief engineer for packaging service in 1948. In 1952, Mr. Kindseth built and organized the Minneapolis research laboratory, and was named to supervise it. In his new position, Mr. Kindseth will take over duties formerly handled by Daniel Melcher, who has announced that he will retire.

California Fertilizer Co. Names New Manager

LOS ANGELES, CAL.—Announcement has been made of the appointment of Murray C. McNeil as vice president and general manager of the Southern California Fertilizer Co. with headquarters in Los Angeles. Mr. McNeil succeeds Walter Houser who has been with the company since its inception in 1916 and served for many years as president and general manager.

Southern California Fertilizer Co. has operated over forty years in this area and at the present time has branches at Riverside serving the citrus area and has recently opened a branch office and warehouse at Wasco, Cal. under the local management of Carl Boone of Wasco.

In addition to manufacturing and distributing a complete line of fertilizers, the company now has added other agricultural chemicals including insecticides and defoliants for use in the cotton areas of the South-

ern San Joaquin Valley. Other officers of the company include W. E. Simas, president; Earle E. Kaplan-sky, vice president; and V. A. Frizzell, secretary. Mr. Houser will continue in an advisory capacity with the company.

TVA Offers Materials For Experimentation

KNOXVILLE, TENN.—The Tennessee Valley Authority has announced that any interested fertilizer manufacturing company in the United States outside of the Tennessee Valley, can now experiment with new TVA fertilizer materials.

For the coming fertilizer season, fertilizer plants around the country can now obtain up to 100 tons during any fiscal year of each of TVA's two newest fertilizer materials. They are for use in the manufacture of high analysis mixtures, for making new products or for experimenting

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in the use of new fertilizer processes, TVA officials say.

Products available are calcium metaphosphate with an analysis of 60 to 62% available P_2O_5 and diammonium phosphate analyzing 21-53-0. Both materials are available in bulk or in 80-pound bags.

Dr. Leland G. Allbaugh, director of TVA's division of agricultural relations, says that applications will be studied to see if the firm's proposals can effect economies in fertilizer production, or have experimental and educational value. Application forms are available from the chief, Fertilizer Distribution Branch, Tennessee Valley Authority, New Sprinkle Building, Knoxville, Tenn.

BIGGER FARMS

AMES, IOWA—Average farm size in Iowa is continuing to increase. The "average" Iowa farm now covers 176.5 acres, about 8 acres larger than in 1950, John F. Timmons and Gene Wunderlich, Iowa State College economists, report.

Average cash farm income of Successful Farming farmers in 1955 exceeded \$10,000

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WORLD REPORT

By **GEORGE E. SWARBRECK**
Croplife Canadian and Overseas Editor

Chilean Nitrate

Chile's nitrate industry has started the long, slow climb back to prosperity aided by two credits totaling \$27.8 million to finance the purchase of American equipment and services.

Hit by the inroads made by synthetic materials, beset by labor troubles and operating at uneconomic levels, the nitrate industry saw its production and sales slipping.

Shipments of nitrate in the 12 months ended June 30, 1956, were 1,344,000 tons, compared with 1,487,-

000 tons in the preceding 12 months, a cutback of nearly 10%.

The Washington Export-Import Bank has voted a \$16 million authorization for the Anglo-Lautaro Nitrate Corp. and one for \$11.8 million to Cia. Salitrera de Tarapaca y Antofagasta (CSTA). Both companies will use the money to make operations more efficient, at the same time reducing costs of production. Anglo-Lautaro is reported by trade sources to produce two thirds of the nitrate exported from Chile while CSTA ranks in No. 2 spot.

Anglo-Lautaro, according to Harry F. Guggenheim, chairman, proposes to spend a total of \$25 million on the expansion program. CSTA will spend \$14.8 million.

It is proposed to buy equipment to crush, process and refine nitrate ores. Some ancillary equipment, including transportation facilities, will also be bought.

These programs are aimed at enabling Chile to maintain its share of the world nitrate market. Production of synthetic nitrates has caused a reduction in demand, particularly in the U.S. The demand from continental Europe is on the upswing. The producers say they are confident they can maintain the strength of the Chilean trade.

Anglo-Lautaro

Anglo-Lautaro officials say they intend to increase the number of solar evaporation ponds which will permit greater recovery of nitrates

from the residues of the Guggenheim process. Additionally, large shovel ore cars, and electric locomotive will be purchased to improve the mining and transportation services. Included in the company's program is the improvement of loading and handling facilities at the port of Tocopilla.

The expansion program of CSTA is aimed at trebling production at Victoria in northern Chile. This is the firm's chief plant. Extensive areas of nitrate deposits, said to be the largest known in the world, are in close proximity to Victoria.

Concurrent with these developments is a boost in the export effort. Already a Chilean commercial delegation has obtained the cooperation of the government of India in formulating a trade agreement that will greatly facilitate the movement of nitrate to India.

Dutch Exports

The fertilizer export trade of the Netherlands is booming. To keep pace with the greater activity, the Centraal Stikstof Verkoopkantoor, the sales office of the three largest producers of nitrogenous fertilizers in the Netherlands, has been provided with a new facility for storing and shipping fertilizers. Owner of the plant is N. V. Nederlands Transport Bureau, agent for the selling group.

Built at Waalhaven, near Rotterdam, the plant comprises a large warehouse with a storage capacity of 40,000 tons of bulk fertilizers, about 35,000 sq. ft. of open storage space, several cranes, a conveyor belt system 3,280 ft. long and mechanical equipment for bagging and weighing.

Loading of bulk fertilizers into seagoing vessels can be accomplished at the rate of 300 tons an hour and requires the attention of only three operatives, one in the control room and two in the warehouse.

If the increased export business is maintained, plans will be made to increase the new facilities by one third.

Indian Gypsum

When India's Sindri Fertilizer Factory first went into production, supplies of gypsum, used in the manufacture of ammonium sulfate, came from mines at Daudkhel, now located in Pakistani territory. When partition came, the Indians had to look elsewhere. Several discoveries of deposits have been made, but Sindri now getting most of its needs from mines in Rajasthan.

Disease Outbreak

Unofficial reports from the Argentine are talking about an outbreak of a fungus disease, septorios, affecting areas in southern Santa Fe and eastern Cordoba. The last outbreak of this disease was in the 1939-40 crop year and reports at the time said that the effects were "deplorable" on the crops.

U.K. Importer Expands

A new storage warehouse with capacity of 1,000 tons of bags of boron products has been completed at the Bootle, near Liverpool, plant of Borax & Chemicals, Ltd., British subsidiary of the American Potash & Chemical Corp. The company has a borax refinery at Bootle.

The new warehouse, with 66,000 cu. ft. of storage space, was built, the firm explains, to accommodate AP&CC's increased shipments of boron chemicals to the U.K.

SERIOUS HOPPER THREAT

FARGO, N.D.—Preliminary information indicates that the most serious threat to crops from grasshoppers that has existed in recent years will be felt next year in North Dakota, report on the state hopper outlook now being prepared by the North Dakota Agricultural College Extension Service.

Are
you good
at
figures?

EXAMPLE 1

Valve Bags for Granular or Pulverized Materials

If you increased filling production from 12 per minute to 15 or more per minute—without paying a penny more for sleeve or special insert bags... what would be the percentage of increase—and dollar savings to you—per ton—per hour?

EXAMPLE 2

Open Mouth Bags for Free Flowing Materials

If you increased filling production from 15 per minute to 20 or more per minute—without paying a penny more for your open mouth multiwall bags... what would be the percentage of increase—and dollar savings to you—per ton—per hour?

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.



—check and mail today—

- ☐ We are interested in Example 1.
☐ We are interested in Example 2.
☐ We are interested in both examples.

NAME OF COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____ PRINCIPAL _____

PRODUCT MFD. _____

We have the bags and the packer to effect such savings—or more!

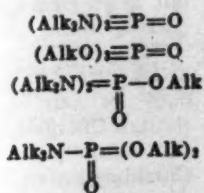
Give us the time to give you the facts!

Dependable as a service for 3 generations. Exclusive Sales Agents for the Kraft-packer Automatic Filling Machine and one of the largest integrated producers of multiwall bags with plants in St. Marys, Georgia and Gilman, Vermont, manufacturing every type of multi-wall bag in use today!



Industry Patents and Trademarks

2,765,252. Synergistic Bis-(Dimethylamino)-Fluorophosphine Oxide Insecticidal Compositions. Patent issued Oct. 2, 1956, to Max Pianka, Wheat-hampstead, England, assignor to the Murphy Chemical Co., Ltd., Wheat-hampstead. An insecticidal composition containing bisdimethylaminofluorophosphine oxide and as a synergist a water-soluble, compatible member of the group consisting of the compounds of the following general formulae:



wherein the symbols Alk represent alkyl groups which may be different in the same compound, bisdimethylaminofluorophosphine oxide and the synergist being present in the relative proportion of about 78:22 per cent by weight to about 66%:33% per cent by weight.

2,766,283. Preparation of Fertilizer Compositions. Patent issued Oct. 9, 1956, to Eugene Turner Darden, New Castle, Del., assignor to E. I. duPont de Nemours & Co., Inc., Wilmington, Del. A process for preparing a urea-formaldehyde composition having an insoluble nitrogen content of at least 60% and an availability index of at least 45% which comprises bringing together urea and formaldehyde in a mol ratio of from 1.5 to 4.5 mols of urea per mol of formaldehyde and in the presence of 20 to 80 mols of water per mol of formaldehyde at a temperature of 20° to 80° C. maintaining the pH of the mixture at from 1 to 6 by adding acid thereto, allowing the urea and formaldehyde to react under these conditions for a period of time within the range of 3.5 minutes to 2 hours while subjecting the reaction mixture to mild agitation sufficient to prevent settling of the precipitated solids, neutralizing the reaction mixture to a pH of at least 6.0, thereafter separating by filtration a precipitated urea-formaldehyde product from the reaction mixture, recycling the resulting filtrate with make-up urea and formaldehyde under the same conditions, and drying the resultant unwashed precipitated urea-formaldehyde product.

2,766,298. Manufacture of DDT. Patent issued Oct. 9, 1956, to David B. Guthrie, St. Louis, and William S. Knowles, Kirkwood, Mo., assignors to Monsanto Chemical Co., St. Louis. In the process for preparing 2,2-bis-(p-chlorophenyl)-1,1,1-trichloroethane by the condensation of chloral with monochlorobenzene in the presence of sulfuric acid, the steps comprising condensing substantially stoichiometric proportion of monochlorobenzene and chloral in the presence of concentrated sulfuric acid, heating the reaction mixture resulting from said condensation to a temperature of from about 35° C. to about the incipient melting point of the 2,2-bis-(p-chlorophenyl)-1,1,1-trichloroethane product until the acid layer is clear, allowing the resulting mixture to settle thereby forming a layer containing the solid 2,2-bis-(p-chlorophenyl)-1,1,1-trichloroethane product and a lower layer of acid, and withdrawing the acid layer.

2,767,045. Treatment of Phosphate Rock to Recover Phosphorus and Uranium Values. Patent issued Oct. 16, 1956, to Robert F. McCullough, Lakeland, Fla., assignor to the United States of America as represented by the U.S. Atomic Energy Commission. A process for the recovery of phosphorus values from phosphate rock which comprises reacting comminuted phosphate rock with aqueous sulfuric acid of between about 63 and about

70% strength said sulfuric acid being added to the extent of between about 101 and about 120% acidulation of that required to form monocalcium phosphate and to react with the reactable impurities present in the rock while mixing the reaction mixture during the acid addition for a sufficient length of time to insure thorough distribution of the acid throughout the rock, the acidulated rock admixture containing a minor amount of a reagent selected from the group consisting of hypochlorites, chlorites, chlorates, perchlorates, alkali metal nitrates, alkaline earth metal nitrates, potassium permanganate, manganese dioxide, hydrogen peroxide, and nitric acid, aging the admixture for at least about fourteen days, admixing and slurrying the aged acidified phosphatic material with a liquid selected from the group consisting of

water and an aqueous unsaturated monocalcium phosphate solution, separating undissolved solids from the resultant slurry and recovering uranium and phosphate values from the separated phosphatic leach solution.

2,767,071. Herbicidal Compositions. Patent issued Oct. 16, 1956, to Henry L. Morrill, Clayton, Mo., assignor to Monsanto Chemical Co., St. Louis. A herbicidal composition comprising from 1 to 5 mole weights of the dimethylamine salt of 2,4-dichlorophenoxyacetic acid for each mole weight of the isopropylamine salt of 2,4-dichlorophenoxyacetic acid.

2,767,072. Soil Regeneration. Patent issued Oct. 16, 1956, to Henri Coanda, Paris, France. A process for the production of a soil regeneration substance consisting in pressing the contents of ruminant paunches to separate the liquid portion containing active biotic factors from the solid portion, pressing green vegetation to extract a liquid portion containing active biotic factors from the solid por-

tion thereof, mixing said solid portions from said paunches and said green vegetation with phosphates to form a solid mixture, mixing the liquid portion from said paunches with the liquid portion from said green vegetation and with liquid manure to form a liquid composition adding to the solid mixture said liquid composition, thereby causing the mixture to become warm, cooling the mixture, inoculating said mixture with microbial cultures selected from the group consisting of fixers of nitrogen molecules, nitrous ferments, nitric ferments, and cellulose ferments, and then adding elements in the colloidal state.

2,767,114. Seed Disinfectants Containing Arsenate Salts of Monothio Acids. Patent issued Oct. 16, 1956, to Ewald Urbschat, Köln-Mulheim, and Paul-Ernst Frohberger, Odenthal, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany. Seed Grain disinfectants containing as an active in-

(Continued on page 21)

IN
GRAPES,
POTASH-ENRICHED
FERTILIZERS
MAKE
THE
DIFFERENCE



with sufficient potash



without sufficient potash

Grapes or green beans—in anything that grows—good rich soil makes the difference between good crops and bad. Balanced fertilizers are needed to insure healthy bumper crops. And it's the potash in these balanced fertilizers that builds resistance to plant diseases and improves quality and yield.

USP's high-grade muriate of potash has the highest K₂O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

UNITED STATES POTASH COMPANY

DIVISION OF UNITED STATES BORAX & CHEMICAL CORPORATION
30 Rockefeller Plaza, New York 20, N. Y.
Southern Sales Office
Rhodes-Haverly Building, Atlanta, Georgia



HIGH-GRADE MURIATE OF
POTASH 62/63% K₂O
GRANULAR MURIATE OF
POTASH 66% K₂O MIN.

REG. U. S. PAT. OFF.

Iowa Entomologists Find Spotted Aphid In 56 Counties; Predict it Will Spread Throughout State by Middle of November

AMES, IOWA—Iowa's new insect pest, the spotted alfalfa aphid, has been collected in 56 counties and probably will invade all counties by mid-November, according to Dr. Harold Gunderson, extension entomologist at Iowa State College. He reported that checks in 56 counties up to Nov. 1 showed the average population is 3 to 5 aphids per sweep of an insect net. Maximum infestation of 20 aphids per sweep was found in one field in Humboldt County.

He pointed out that the insect was found for the first time in Iowa only two months ago. Initial checks showed populations ranged from 1 aphid per 100 sweeps to a maximum of only 3 aphids per sweep.

Research on the spotted alfalfa

aphid is under way in Iowa, as well as in other states. But at the present time, information is scarce. About all we can do is wait and watch developments, Dr. Gunderson said. "It may be that the insect can't survive Iowa winters and our present population may die out before spring. Also, reinfestation from the south may or may not occur early in 1957."

The insect pest was first found in 1954 in New Mexico, Arizona, Nevada, Texas and California. Since then, it has invaded other states including Florida to the southeast and Minnesota, Iowa and South Dakota to the north. Wind currents appear to be the primary means of transferring the insect pest, propelling wing-

ed females to neighboring fields and new areas.

The spotted alfalfa aphid is smaller than the pea aphid and has brownish-yellow spots on both its lower and upper body surfaces. The insect pests suck juice from alfalfa plants and produce tremendous quantities of honey dew, which make the plants hard to cut and cure, Dr. Gunderson explained.

SHORT COURSE

CARBONDALE, ILL. — Southern Illinois University's fourth annual winter short course in agriculture will begin a four-week session on the campus here Jan. 7, according to Alex Reed, supervisor of adult education in agriculture. Seventeen courses from fields of agricultural economics and engineering, agronomy, forestry, horticulture and animal, dairy or poultry science will be available for short course students.



Why it pays to sell the name that's known and trusted in important Farm Markets:

Profit and the pride in selling products that help your customers are the big reasons you are in business. Combine all of Phillips 66 multitude of satisfied farm users and you get a big advantage in selling Phillips 66 Ammonium Nitrate to your customers. Further, you have the assurance that the production of

Phillips 66 Ammonium Nitrate is backed by the same progressive research that has made Phillips such a fast growing organization.

So, sell with confidence for present and future profit... sell with a leader—Phillips 66 Ammonium Nitrate.

... and Phillips 66 Ammonium Nitrate offers you these big profit advantages:

- 1** Consistent, convincing advertising of Phillips 66 Ammonium Nitrate. This includes outstanding state and regional farm papers... and radio—all pre-selling Phillips 66 Ammonium Nitrate for you.
- 2** An outstanding product, backed by all of the vast resources of Phillips laboratories, manufacturing facilities, plus actual use on thousands of farms. Phillips 66 Ammonium Nitrate is prilled to flow freely, handle easily.
- 3** Personal service from your Phillips 66 Fertilizer field man and prompt deliveries are included in the many profitable extras you get from Phillips 66.

Call your nearest Phillips office, listed below, for help in planning a bigger and more profitable 1957.

PHILLIPS CHEMICAL COMPANY
A Subsidiary of Phillips Petroleum Company, Bartlesville, Oklahoma

Offices in:

AMARILLO, TEX.—First Nat'l Bank Bldg.
ATLANTA, GA.—1428 West Peachtree Street
BARTLESVILLE, OKLA.—Adams Bldg.
CHICAGO, ILL.—7 South Dearborn St.
DENVER, COLO.—1375 Kearney Ave.
DES MOINES, IOWA—6th Floor, Hubbell Bldg.

HOUSTON, TEX.—1020 E. Holcombe Blvd.
INDIANAPOLIS, IND.—1112 N. Pennsylvania St.
KANSAS CITY, MO.—500 West 39th St.
MINNEAPOLIS, MINN.—212 Sixth St. South
NEW YORK, N. Y.—80 Broadway
OMAHA, NEB.—6th Floor, WOW Building
PASADENA, CALIF.—330 Security Bldg.

RALEIGH, N. C.—804 St. Mary's St.
SALT LAKE CITY, UTAH—68 South Main
SPOKANE, WASH.—521 E. Sprague
ST. LOUIS, MO.—4251 Lindell Blvd.
TAMPA, FLA.—3737 Neptune St.
TULSA, OKLA.—1708 Ulta Square
WICHITA, KAN.—501 KFH Building



A companion high nitrogen fertilizer for your quality mixed goods.

FERTILIZER OUTPUT

(Continued from page 1)

their share of the market will spread a little thinner."

Comparative figures on production of various materials were presented in the report, as shown in tables 1 and 2.

The report stated that U.S. export trade in pesticides has continued good volume in 1956, although it was down slightly in the first half of the year. "Exports during the first months totaled 158,608,000 pounds valued at \$44,454,000, which represented a decrease of 5% in quantity but a 6% increase in value over the corresponding period of 1955.

"The North and Central American areas accounted for approximately 50% of our export shipments, although the quantity declined from the preceding year. Shipments to the Caribbean area, South America, Asia, Oceania, and Africa all increased in 1956 with Africa showing the most marked advance. Miscellaneous agricultural insecticides for Egypt accounted for much of the increase in African take. Of the individual pesticide products exported to all destinations, copper sulfate and DDT are still the leading items," it said.

Table 1—Production of Fertilizer Materials U.S. for Selected Months, 1955-56, in Short Tons

	July 1956	Jan.-July 1956	Jan.-July 1955
Ammonia, anhydrous	253,361	2,014,580	1,886,400
Ammonium nitrate (total) ..	158,941	1,343,732	1,192,000
Fertilizer grade ..	129,296	1,107,213	1,013,500
Ammonium phosphate fertilizer grade ..	13,181	113,249	100,000
Ammonium sulfate	105,001	1,178,611	1,242,800
Synthetic	81,743	663,352	681,700
Coke oven	23,258	515,259	561,100
Nitric acid	170,341	1,412,921	1,356,400
Phosphoric acid ..	235,900	2,144,019	1,954,900
From phosphorus	112,312	914,214	837,900
From phosphate rock ..	123,588	1,229,805	1,117,000
Potash (100% K ₂ O) ..	111,029	1,265,440	1,246,800
Sulfur			
Elemental (long tons) ..	664,530	3,999,044	3,616,700
Frasch	621,130	3,727,244	3,087,200
Recovered	43,400	271,800	299,500
Sulfuric acid ..	1,129,556	9,372,615	9,055,100
Superphosphate ..	123,494	1,401,372	1,329,200
Normal (including enriched and wet-base goods)	78,156	933,721	925,100
Concentrated ..	45,338	467,651	404,100
Urea	25,783	234,423	492,500

*Figure is for March-July; production not reported until March.
***Not available.

Production of pesticidal materials was reported as follows:

Table 2

	July 1956	Jan.-July 1956	Jan.-July 1955
Benzene hexachloride (gamma basis) ..	718	4,399	2,600
Copper sulfate ..	6,196	42,192	43,900
DDT (100%) ..	5,964	41,062	35,500

IOWANS NAME OFFICERS

BLENCO, IOWA—The anhydrous ammonia dealers of Iowa elected Matt Sylvan of Blenco president recently. Mr. Sylvan succeeds Ben Bonzer of Charles City as president. Other officers named were Howard Greiner, Keota, first vice president; Pat Burnett, Storm Lake, second vice president; Russ Legreid, Mason City, third vice president; and Dwight Bell, Audubon, secretary-treasurer.

POTASH

(Continued from page 1)

Rico, and Hawaii amounted to 558,350 tons of salts, equivalent to 327,850 tons K₂O, an increase of 3% in salt and 2% in K₂O. These deliveries were comprised of 510,423 tons of muriate of potash, 3,207 tons of manure salt and 44,728 tons of sulphate of potash and potash-magnesia. The chemical industry took 45,298 tons of muriate of potash and sulphate of potash, containing an equivalent of 28,170 tons K₂O, an increase of 3%. Exports outside of North America amounted to 84,487 tons of salts containing 50,000 tons K₂O, an increase of 26% in salt and 24% in K₂O.

Better Selling

**Richer
Fields for
Dealers**

A SPECIAL CROPLIFE DEPARTMENT TO HELP RETAILERS IMPROVE MERCHANDISING KNOW-HOW

BUILDING GOOD WILL

A Promotion Plan to Reach Farm Youth in Rural Schools

By **AL P. NELSON**
Croplife Special Writer

In the trade territory which every farm supply dealer serves there are from one to five or more rural schools, attended mainly by pupils who are the sons and daughters of farmers. These rural schools have one teacher, sometimes two, rarely more. Often they consist of just one room.

What are you doing to reach these farm youngsters who attend such schools? They have eager young minds, they are willing to learn. In order to give these youngsters a well rounded education, the rural teacher usually sends to the state department of visual education to secure films to show the children about the coffee industry in Brazil, how cotton is grown in the South, how plastics are made, how automobiles are made, etc. The school board which has not provided the rural school with a projector, for the showing of films, is backward indeed.

If the school children see all these movies mentioned above, why shouldn't they also see films on how fertilizers are made, transported, applied and what they produce? This is a marvelous story that farm youngsters would appreciate. The same can be said for the pesticides, fungicides, etc. Show how they are manufactured and what they do.

Films like these have a direct and interesting application to the lives of the farm children, and they will realize it. Furthermore, the children will talk with their parents concerning such films, and thus build acceptance of fertilizer and other farm chemical products in many homes.

Rural teachers are often at a loss for suggestions on interesting films to show to their classes. And if you can get such films free of charge from your sources of supply, etc. you save the teacher the trouble and expense of sending for them and of wrapping them up and sending them back.

It would be a good will gesture for the fertilizer dealer to be present at the schools when such films are shown. The teacher might even ask the dealer to say a word or two about the uses of such fertilizer products in the area. This sort of talk certainly would do much good, however brief it might be.

I know one implement dealer who tells me that he had such a fine selection of agricultural films, plus comedies, that he is asked to five or six large farm meetings every year to show his films. Through such activities he gets to know many framers whom he might not otherwise contact.

I am often surprised at the number of fertilizer dealers who take colored pictures of their fertilizer activities, especially of growing crops of customers. These colored pictures are mounted on slides and shown in display rooms and offices to interested customers.

But I have yet to hear of a fertilizer dealer who offered the use of these slides, along with a short lecture to a rural school. I am certain that such slides would be welcomed in

many schools and that activity of this sort would be valuable to the alert dealer in building good will and business. Many a dealer will spend much more time working on a questionable sales promotion and still neglect very vital promotion such as cultivating rural school relationships.

Always remember that teachers and pupils are eager for new learning experiences, and the alert dealer may have many an opportunity to help such groups and gain more good will for himself and his business. This program might even include a school or class tour of his store showing how fertilizer is received, stored and sold, and wind up with a colored slide showing in the dealer's display room, with milk or coke and cookies afterward.

Then there is always the opportunity to make use of the Bug of the Week reprints which Croplife has available for interested dealers at low cost. If a sample reprint is shown to a teacher and explained to her, she may accept the donation of some of these booklets to her classes and give an explanation of some of them. Or she may invite the dealer to do so.

The pictures on the booklet sheets appeal to students, because the picture of the insect pest is usually in cartoon style. Many farm youngsters are acquainted with such pests and will be interested in learning more about them and how to control them. They may even take such reprints home to show to dad and mother, and thus sales of control products may be a result.

Practically every rural school has art classes. Some classes contain pupils with a great deal of ability, some with only average ability. Perhaps the fertilizer dealer can offer to award prizes to the ten pupils who can turn in the best, colorful drawings of insect pests, based on the Bug of the Week reprints.

The winning drawings can be displayed in the dealer's store, along

(Continued on page 14)



SHOP TALK

OVER THE COUNTER

FOR THE DEALER

By **EMMET J. HOFFMAN**
Croplife Merchandising Editor

If you were to study a cross-section of men and women noted for success in personal selling, you would find a dozen main functions which these experts all do well, claims Donald F. Mulvihill, professor of marketing, University of Alabama.

These common skills are: Greeting customers, asking questions, displaying merchandise, putting customers in a good frame of mind, showing interest, using opinions as selling points, supplying facts, answering questions, meeting objections, agreeing with customers, suggesting additional merchandise and building repeat business.

Successful sellers often start off by using such greetings as "Good morning! May I help you?" or "That's pretty good, isn't it?", according to Prof. Mulvihill, who continues:

"Good questions are short and easy to answer without the chance of embarrassment. Thus, for example, the skilled salesperson is likely to use an approach like: 'How soon do you need this?' instead of 'How much can you afford to spend?'"

"Effective salespeople show as they sell, performing several functions at once. For instance, they couple display of merchandise with greeting the customer, answering his questions, stating facts and using opinions as selling points. They get items from counters and off shelves and into customers' hands quickly, with little worry about damaged goods or the extra work involved.

"Most able salespersons rely on ordinary acts of courtesy and friendliness to get customers in good frames of mind and keep them there: offering a seat is typical. They pay close attention, too, to customers' comments and reactions.

"Crack sales personnel show interest by remembering names and past purchases of regular customers, by inviting new ones to put their names on a mailing list for announcements and by offering special services.

"On the use of opinions as selling points, astute selling employees note

(Continued on page 16)

Minnesota Fertilizer Short Course Planned

ST. PAUL—The sixth annual Soils and Fertilizer Short Course will be held at the University of Minnesota's Institute of Agriculture Dec. 3. Program chairman for the event is Charles A. Simkins, extension soils specialist at the university.

Topics at the short course will include minor element chelates for high lime soils, solubility of fertilizers, water use and crop fertilization, liming, the soil bank and fertilizer use and effect of fertilizer on the farm business.

An afternoon panel of soils scientists and Minnesota farmers will discuss soil management for crop production. Speakers will include soils scientists from the University of Minnesota and other states.

Value of Phosphate

FARGO, N.D.—Hundreds of farm trials with phosphate fertilizer have demonstrated the value of phosphate applications on deficient soils, according to the North Dakota Agricultural College. Trials with wheat grown on summerfallow have shown an average yield improvement of nearly 5 bu. an acre in favor of phosphate. The average cost of the phosphate fertilizer applied per acre has been about \$2.

Office Mechanization for Small Industry

BACKGROUND—The necessity for better records and more up-to-date management reports is making obsolete the many "estimated" and "rule of thumb" answers to business problems. Accurate, current information is just as important to the success of the small manufacturing organization as it is to any large concern. In fact, the more modest the business, the more important it becomes to make the right decision the first time.

Understanding the facts of a business—facts presented in an organized, easily-understood form—is the starting point for intelligent management. For example, you need facts to answer such typical questions as: Who is spending the money and what for? What material is being used and how much? When should we reorder and how much? Who is buying and how much? Who is paying on time and who is not? What is the true cost of each product?

How do you get the answers to questions like these? There should be no serious disagreement with the proposition that most of the facts management needs must come through the record keeping system. Mechanization of this system offers great opportunities for improving

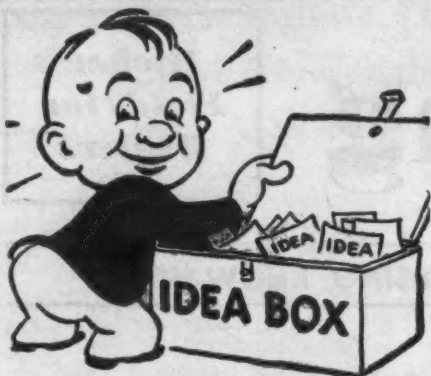
EDITOR'S NOTE: Good records are important to the success of small manufacturers as well as large manufacturers, to the large retail operation as well as to the small retail store. Those in management positions in farm chemical retailing will find the accompanying article prepared by technical specialists in private business helpful in keeping better records, thereby permitting quicker and sounder decisions. The article is reprinted from a recent *Small Business Administration* bulletin.

speed, completeness, and accuracy. And practical mechanization is not limited just to large concerns. Small concerns can use it, too, in sales records, payroll and labor records, materials records, finished stock control, billing and similar situations. There are various checkpoints which small firms can use to avoid misconceptions and assure efficient and profitable office mechanization. The following sections outline some possibilities.

THREE METHODS—It is slow and costly to extract good reports from a cumbersome, inaccurate record-keeping system. Conversely, it is relatively simple and inexpensive to build good reports from an efficient set of records. There are three main plans of attack on office paperwork:

(1) Longer hours and increased clerical effort.

(Continued on page 13)



What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

No. 5573—Lift Gate

The Anthony Co. announces that a light weight lift gate model is now available for larger trucks handling light, bulky loads. The gate has a loading area of 82 by 30 in. and a lifting capacity of 1,000 lb. One hydraulic cylinder does the lifting and lowering and is powered either by a battery driven pump or



a power take-off and pump combination. Loading and unloading can be done from the side even at curb level. The lifting and lowering operations are controlled by one lever from either side of the truck. The gate stops automatically at ground and truck floor levels or can be stopped and held at any intermediate height. For more information on the lift

gate, send for the new folder, "Automation For Transportation." There is no obligation. Check No. 5573 on the coupon and mail it to this publication.

No. 5592—Bagging Equipment Catalog

A catalog has been produced by the Bemis Bro. Bag Company's packaging service division to describe its bag filling machines, bag closing conveyors and pedestal sewing machines. The catalog is a compilation of 10 bulletins which give specifications, pictures and operational details of three types of sewing machine pedestals, dual head sewing machine pedestal, flat bed conveyor, V-belt conveyor, Vee-Trof conveyor, Vee-Slat conveyor and two models of the E-Z Pak bagger. The catalog is available if you will check No. 5592 on the coupon and mail it to this publication.

No. 6499—Acid Pump

Dorr-Oliver, Inc., announces the availability of a new two-color, six-page bulletin, "The Olivite Acid Handling Pump." The bulletin describes the design features, corrosion-resistant materials of construction, applications, sizes and capacities of the acid handling pump. In addition, it contains equipment photographs, cross-sectional wash drawings of the unit

and performance and power requirement graphs. The capacity of the pump ranges from 5-1,400 gpm with hydraulic heads up to 120 ft. The extremely wide range of flows and heads is possible through the availability of three pump sizes—1½ in., 2 in. and 4 in., plus a choice of varying diameter impellers. All sizes may be ordered with either direct or V-belt drive and bases for both types. Secure more details by checking No. 6499 on the coupon and mailing it to Croplife.

No. 6500—Information Cards

Clemson Agricultural College and the extension service have prepared information cards to emphasize their lime and fertilizer program in 1957. The cards are designed for posting in fertilizer dealers' offices. Currently available are cards with the following titles: "How Much Does My Nitrogen Cost?" and "1956 Fall Planting Schedule." The state's agronomists state that "we want our farmers to make efficient use of more plant food and more lime in order to increase the state's farm income." The cards are designed for use by the fertilizer industry representatives for distribution and display. To receive available cards check No. 6500 on the coupon and mail it to Croplife.

No. 6501—Fork Truck

An 8,000-lb. capacity model with dual drive wheels, the EUT-8024, is the newest addition to Clark Equipment Company's line of battery powered fork-lift trucks. A turning radius of 85 in., aisle for right angle stacking (including 48-in. long load) of 148½ in. and over-all length of 133 in. are dimensional features of the machine. With four speeds forward and four reverse, it will travel loaded at 5½ mph and climb a 10% grade, it is claimed. To secure more complete details check No. 6501 on the coupon and mail it to this publication.

Also Available

The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

No. 6496—Process Control

A new 16-page catalog on pneumatic instruments for process control has been published by United States Gauge, Division of American Machine & Metals, Inc. Catalog No. 505 discusses indicating pilots, transmitters and receiver gauges. A new instrument shown for the first time in the

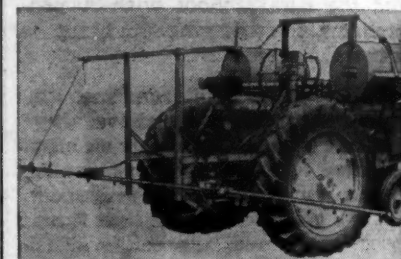
catalog is the 3½-in. scanning diaphragm receiving gauge with rotatable dial which permits the operator to rotate the dial to a common set point. The pilot is claimed to be unique in that it provides both input and output gauges and features a large dial showing both set point and process variable. Complete information contained on measuring elements for pressure and temperature applications. Ordering information, dimensions and typical dial faces are all included. Check No. 6496 on the coupon and mail it to Croplife to secure the catalog.

No. 6495—Copper Oxide Booklet

The Calumet Division, Calumet Hecla, Inc., announces a new booklet on "Calumet Brown Copper Oxide-Fertilizer Grade." The booklet on the concentrated source of copper for fertilizer mixtures and direct soil applications describes brown copper oxide in detail and shows where and how it can be used most economically. It also highlights the research and experimental programs carried on its behalf. The booklet may be obtained by checking No. 6495 on the coupon and mailing it to Croplife.

No. 6488—Liquid Applicator

Details of the new "all-purpose" liquid applicator suitable for both insecticide and herbicide applications, as well as for liquid fertilizer, have been announced by the Larson Machine Co. An outstanding feature claimed for the basic applicator unit is that it can be fitted with inexpensive at-



tachments to make diversified applications while plowing, discing, planting or cultivating. It is a new concept for farm operation because of its flexibility, company officials state. Details are available by checking No. 6488 on the coupon and mailing it to Croplife.

No. 6497—Valve Closure

An automatic valve closure which the manufacturer, Hudson Pulp & Paper Corp., says virtually eliminates sifting from multiwall bags has been developed, and is scheduled for immediate introduction for use. The Hudson product is known as the Seal-O-Matic Sleeve. It is an insert to be used in the loading of pulverized granular, crystal and pellet-type products. Company officials say that the device will be effective in the loading of fertilizer, chemicals, lime and other products for which, at present, the annual loss from sifting is high. To secure more complete details check No. 6497 on the coupon and mail it to Croplife.

No. 6493—Electrostatic Dusting

Agricola, Ltd., has prepared an 8-page booklet entitled, "Electrostatic Dusting." Electrostatic dusting uses the principle of electrostatics as a method of applying crop protection chemicals. The booklet states that the basic principles underlying electrostatic dusting are contained in the two axioms that "like forces repel, unlike forces attract," and that "an electrical force induces an equal and opposite charge at an equal distance on the other side of a conducting surface." The instrument designed by the company for this type of dusting is called by the trade name, "Agricola Electro-duster." The bookle-

Send me information on the items marked:

- | | |
|---|---|
| <input type="checkbox"/> No. 5573—Lift Gate | <input type="checkbox"/> No. 6494—Soil Conditioner |
| <input type="checkbox"/> No. 5592—Catalog | <input type="checkbox"/> No. 6495—Booklet |
| <input type="checkbox"/> No. 6486—Anhydrous Systems | <input type="checkbox"/> No. 6496—Process Control |
| <input type="checkbox"/> No. 6487—Gardening Booklet | <input type="checkbox"/> No. 6497—Valve Closure |
| <input type="checkbox"/> No. 6488—Applicator | <input type="checkbox"/> No. 6498—Spray Gun |
| <input type="checkbox"/> No. 6490—Equipment | <input type="checkbox"/> No. 6499—Acid Pump |
| <input type="checkbox"/> No. 6491—Pipe Joint | <input type="checkbox"/> No. 6500—Information Cards |
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No. 6498—Insecticide Spray Gun

The R. C. Can Co. has introduced an insecticide spray gun with a number of new features. Among the features claimed are: It sprays the insecticide at an extreme angle for hitting the underside of foliage; 15 holes in the underside of the discharge plug eliminate clogging; a 1½-in. friction plug comes off for refilling; it has a wax coated inner tube; it has a special felt inner valve and a patented allows valve. Secure additional information by checking No. 6498 on the coupon and mailing it to Croplife.

No. 6494—Soil Conditioner, Nutrient

The Paxton Processing Co., Inc., has announced details of its product, called by the trade name Paxco Topper, a soil conditioner and plant mulch. The product is compounded from dehydrated corn cob meal, treated to kill weed seeds and mold spores and dried for lower shipping expense. Nitrogen is added to balance the nutrient requirements of bacteria which transform the product, on or in the ground, into humus. Advantages claimed for the product are: It will keep down grasses and weeds in nurseries; it is an insulating blanket which holds moisture in the soil; it converts into humus when spaded into the soil; and it conditions the soil. Company spokesmen say the product is priced to compete with mulches and humus. Secure more complete details by checking No. 6494 on the coupon and mailing it to Croplife.

No. 6486—NH₃

Systems

The Dallas Tank Company, Inc., has published a folder and price list for its NH₃ systems, trade named the Economy line. The company makes equipment for various phases of the anhydrous ammonia industry. Application tanks in the following gallon sizes are available: 100, 110, 150, 200 and 250; field tanks—500 and 1,000; parts—150, 250, 300 and 500. The folder lists tank specifications and notes that the tanks are guaranteed for one year. For more complete details check No. 6486 on the coupon and drop it in the mail.

No. 6487—Gardening Booklet

"Facts on Hydroponic Growth" is the title of a booklet written by Dr. Paul A. Chatelier, plant nutritionist. Hydroponics, according to Dr. Chatelier, means literally "growing plants without soil." The booklet explains the author's method of growing plants, shrubs, flowers, fruits or vegetables in a supporting medium (gravel, sand, sphagnum moss, wood chips) supplemented by Chatelier plant food. Good results are obtained with the product, according to the booklet. Hydroponic gardening, it is explained, is especially suitable for apartment dwellers, home owners with small yards and even for those who want to make this type of gardening a profession. A copy of the booklet may be secured without charge by checking No. 6487 on the coupon and mailing it to Croplife.

No. 6491—Pipe Joint

The Smith-Scott Co., Inc., has developed a new type of steel pipe field

joint, which is claimed to reduce the cost of laying pipe in the ground. It is called a "ring-seal field joint." The company states that "the joint embodies a self-sealing rubber gasket, which locks securely into place in a special key-way. This results in considerable flexibility, while guaranteeing leak-proof joints. It is said to be simple enough to be installed by unskilled labor." The joint is made by pushing the spigot end of one pipe three or more inches into the belled end of another, thus placing the "ring-seal" gasket under compression. As the water pressure mounts in its initial flow through the pipe, the gasket moves to one side of the groove and "feathers" out. Once in that position, the joint is claimed to be as strong as the pipe itself. The company's pipe equipped with the

new joints is sold in diameters of 4-20 in. and in lengths up to 40 ft. The joint also allows from 4-6" deflection. More complete literature on the joint is available. Check No. 6491 on the coupon and mail it to Croplife.

No. 6490—Fertilizer Equipment

Edw. Renneburg & Sons Co. has released a new 12-page bulletin describing its continuous granular fertilizer processing equipment. The bulletin covers ammoniators, granulators, continuous combination ammoniator-granulators, dryer furnaces, dryers, coolers, combination dryers and coolers, air handling systems and pilot plant equipment. Included are equipment photographs, plant shots and

detailed drawings. There is also a layout of a fertilizer plant using typical Renneburg equipment and a granular fertilizer unit flow sheet. Secure the bulletin by checking No. 6490 on the coupon, clipping and mailing it to Croplife.

No. 6492—Test Gauge Catalog

A new 8-page catalog just published by United States Gauge, Division of American Machine & Metals, Inc., deals with the selection of test gauges, also cataloging a variety of test gauges for various applications. The publication (No. 400) provides a list of check points for ordering pressure gauges, and is available by checking No. 6492 on the coupon and mailing it to Croplife.



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OFFICE MECHANIZATION

(Continued from page 9)

(2) Training and improvement in clerical efficiency.

(3) Mechanization and the transfer of routine clerical operations to machines.

Of the three, only the last usually offers the potential improvement which many situations demand. This fact is evidenced by the constantly increasing use of office machines.

TWO CLASSES OF RECORD-KEEPING MACHINES—There are two basic classes of record-keeping machines. They might be described as (1) key driven, and (2) automatic processing.

The key-driven group—represented by such machines as the typewriter, adding machine, desk calculator and keyboard bookkeeping machines—comprises fundamentally single-purpose units.

The second group includes such equipment as proof and distribution

machines, automatic addressing machines and (probably the most representative) punched-card accounting machines. This group incorporates most of the multi-purpose units.

Smaller companies have been slow to improve office operations and benefit from automatic machines, but with little justification. At least part of this inertia must be laid to the apparent misconception that the automatic class of office machines can be used economically only in large organizations. That premise is not valid.

The cost of a complete installation of basic punched-card accounting machines can be less than the salary of a clerk.

PUNCHED - CARD RECORD-KEEPING—There are two basic machines in the typical punched card installation:

● **The card punch.** This machine registers the details of a transaction in cards by punched holes. The machine feeds and ejects cards automatically and reproduces repetitive information, such as time, job, or invoice number, at will. Productive speed is limited only by the dexterity of the operator.

● **The sorting machine.** This machine "reads" the information punched in the cards, adds and subtracts, and prints reports or accounting records. It automatically determines card groups, positions forms, makes horizontal distributions, and it can be connected to the card punch to pro-

duce automatically a summary or balance-forward card.

The first step in applying a punched card system to any record-keeping job is designing a card to record the details of the transactions that affect the application. On a basic card, which is standard in size and shape, vertical lines are laid out to create "fields" as required. Sufficient card columns are allowed in each field to accommodate the greatest value encountered. When the fields are captioned, the card design is complete.

A card designed to record punched information only, is referred to as a transcript card. Other card designs include dual cards which contain spaces for hand or typewritten information as well as the fields for the same data in punched form. This type of card is the original or source document as well as the tool which prepares the record-keeping results. Such source records as attendance cards, job tickets, and material requisitions are ideally adaptable to the punched card. Still other designs incorporate stubs and can be adapted where tags, labels, or carbon copies are required.

Every business transaction involves information which affects various phases of the organization. Usually it is necessary that the information from a single transaction appear either individually or in summary form in a number of records. In manual systems this means that each time the information is used, it must be copied, and checked.

In punched-card systems, a transaction is recorded on a card only once. The accuracy of the punched information is verified by any of the usual checking methods or by means of a special verifying machine which involves a second key entry of the same data.

The holes, once punched and checked, become a permanent record. From this point on they can be read by a machine, and the machine can translate the holes into the equivalent of key strokes. Thus the transcribing, posting, summarizing, and other similar functions are handled at high speed—and with the elimination of human error.

PUNCHED CARD APPLICATIONS—Although it is a fact that practically every record-keeping job is being accomplished somewhere by punched-card methods, it is recognized that not every organization can profitably apply the machines to all its paperwork problems. The fact that "Company X" is profitably using punched cards for accounts receivable does not necessarily mean that "Company Y," even though similar in size and in the same industry, can do the same thing.

Nevertheless, punched-card methods can sometimes produce such valuable results that their adoption is profitable, even though the installed machines may not be used full time. The prospective user normally is not technically qualified to make a complete survey of his operations to determine the practicality of an installation. Nor does he have to. Qualified representatives of the machine manufacturers will do this job. However, a brief discussion of some of the more important applications will make clearer what jobs punched-card machines can do, and why they are so often chosen to do them.

SALES RECORDS—Selling and the cost of selling are subject to scientific control. The first essential is adequate information pertaining to sales activity. Specific factors depend upon the type of business, but include product classifications, the extent and character of demand, and marketing channels.

A card is punched for each item or classification on the customer in-

voice. It contains, for example: customer identification, salesman, district or territory, trade class, complete item identification, quantity sold, cost of goods sold, commission tax and amount. The cards are balanced to a control and filed until required. They are then sorted and summarized to prepare various analyses needed. Because all the reports are run from the same set of cards their totals are certain to agree. Items such as sales, returns and cost of goods sold, may be recorded from the sales runs. Also, salesman's commissions, tax statements, and other records can be prepared from the sales cards. This repeated use of single card for different purposes is an advantage peculiar to the punched-card method.

PAYROLL AND LABOR RECORDS—Accurate labor and production costs are vital to the small manufacturer. But the allocation of labor costs to the right cost unit—order, part, operation, process, batch—by manual methods is costly at best. At worst it is inaccurate and, therefore, misleading and dangerous.

Employees' time cards are usually dual records; that is, both written and punched. The card may be either a job ticket, covering a single job or a time ticket, including all jobs worked on during the day. It records the date, identification of the job, employee, starting and stopping time, rate, elapsed time, pieces produced, and amount. At the end of the day the elapsed time is computed from job-clock registrations on the card and checked with attendance time. The cards are then rated, extended and punched. The balancing and computing can be performed entirely automatically.

If the time cards are job tickets also, they are machine listed to prepare an accrued labor register. At the same time a summary card may be punched automatically for each employee, showing total hours, over time hours, and amount. These are then used to prepare the payroll records. The job tickets are placed in the work-in-process file by cost unit. Indirect labor cards are filed by account number.

If the time cards are also daily time reports, they contain the total hours and amount in punched form. One labor card is punched for every job on the time report. Time cards are used to produce the payroll while the labor distribution cards are placed in the work-in-process and indirect labor files.

Punched in Advance

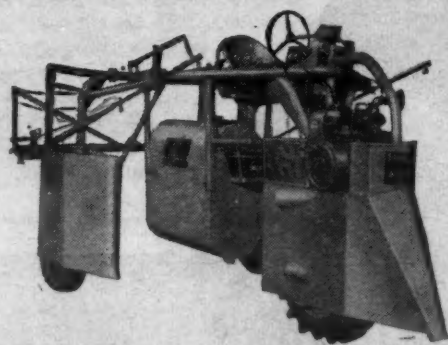
Cards are punched in advance for each payroll deduction such as insurance, savings, purchases, and advances, and are included with the time cards in the payroll runs. Taxes are computed automatically. Summary cards, produced automatically as the payroll is prepared, are used to run wage statistics, and at the end of the year, to prepare tax reports. Paychecks themselves, together with a comprehensive earnings statement, may likewise be punched cards. In this event, a mechanized bank account reconciliation becomes a simple by-product operation of the payroll procedure.

At the end of the accounting period, the cards accumulated in the distribution file are run for the distribution of direct and indirect labor costs. Journals are prepared to charge and credit the accounts affected. If an order cost system is used, orders are closed and costed as soon as they are completed. Direct labor cards may be combined with material cards to secure direct cost. Burden rates are then applied for total costs.

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The Bulletin Board

No. 23 in a series from the Spencer Chemical Magazine, "Today's Fertilizer Dealer"

The Spencer Question Box

Edited by
Proctor Gull

Chief Agronomist, Spencer Chemical Co.



"The Question Box" is one of the most popular features of TFD, Spencer Chemical Company's magazine for fertilizer dealers. Questions submitted by dealers are answered by Proctor Gull, head of Spencer's 7-man field agronomy team. Here are a few timely questions and answers from recent issues of TFD.

1. QUESTION: What is the best time of year to put nitrogen on bromegrass pasture? How much per acre?—Hancock Farm Equipment Company, Herman, Nebraska.

ANSWER: Many bromegrass pastures are extremely undernourished, and indicate their hunger by a yellowish-green color and sparse growth. This is often referred to as a "sod-bound condition."

Experimental data from the University of Nebraska indicates that 150 to 300 pounds of ammonium nitrate (50 to 100 pounds of nitrogen) should be applied on old stands of bromegrass for hay or pasture. The higher rate of application may realize an increase of as much as three tons of hay per acre over unfertilized pasture, depending on the moisture supply.

The best time of year to apply this nitrogen is in the fall (October or November) or early spring (before March 15). Fall application is now recognized as an effective method of increasing forage production (while also spreading the work load over the "not-so-busy" months).

Results indicate that fall application is equal to or superior to spring application for forage production. One Kansas dairy farmer tells us that with adequate rainfall, fall application of ammonium nitrate gives him two to three times as much pasture growth through the fall and extends the grazing season more than four weeks.

2. QUESTION: Do you think liquid fertilizer is, or will be, practical and competitive with dry materials?—Lester Bahimer, F. Mueller & Sons Feed & Seed, Tipton, Iowa.

ANSWER: In the first place, there are many phases of liquid fertilizers

still uncovered. Certainly there will be areas where the liquid nitrogen carriers, such as the commonly known Solution 41, anhydrous ammonia and others, can be competitive with dry nitrogen sources.

However, there are many uses for nitrogen, and there are many situations where the dry materials will continue to have the advantage.

Complete liquid fertilizers containing nitrogen, phosphorus and potassium may be competitive with dry materials in some locations and for some uses. But the size to which complete liquid materials develop will depend on the availability of phosphoric acid produced by the electric process.

Certainly for some years to come phosphoric acid produced by this method will be limited in quantity, whereas phosphoric acid produced for ordinary superphosphate and concentrated superphosphate is more or less unlimited.

The fertilizer business is a large warehousing operation. It is geared to a highly seasonal application period, which makes it difficult for the farmer who depends upon the custom applicator to properly time his fertilizer application.

Where straight nitrogen materials are concerned, now that they are plentiful in supply and farmers are able to choose the source they want, competition and practicability will tell which source becomes dominant.

3. QUESTION: Does too much nitrogen in relation to phosphate and potash do harm in a dry year?

ANSWER: It is bad to have plant nutrients out of balance regardless of whether the year is bad or good. Of course, when you have a dry year, one more item out of balance may make the wagon ride mighty rough.

Today, with no more acres available, the farmer's objective must be to get optimum returns per acre. This means growing the highest yields with his expenses controlled so that the spread between cost of production and acre return is greatest.

To do this, all the operations required in growing a crop must be in balance and timed with the weather and season. Farming is no longer a way of life, but a business. The successful farmer must manage his soil and his business.

counting records, many other reports can be prepared from the payroll and distribution cards. Efficiency, wage incentive, attendance analysis, and other reports are typical.

MATERIAL RECORDS—Proper control of material requires detail records, showing specific material used, the product or job charged, and the cost. If standard costs are used, the variance should be available by the item, as an aid to future planning. Similarly, accurate statements of invested capital should be available at all times. The representative punched card procedure, outlined below, meets these objectives.

A card is punched for each item in inventory: Raw material, work-in-process, and supplies. The cards contain a description of the item, cost and the quantity. Other cards are punched for material receipts. These cards are filed in the inventory file by item number.

Material requisitions may be dual punched cards containing information in both written and punched form, including unit price, extended amount, and job or account charged. Parts requisitions also may contain labor and expense amounts for complete order cost on processed parts. Manual extending is eliminated.

Stock Position Report

Periodically, requisitions are combined with the inventory and receipt cards to prepare a report of stock position. All computations are made and new balance cards are punched automatically. These cards represent the new balances of each item and become the material inventory file for the next period. This file of cards replaces the materials ledger.

After the new balance cards are prepared, direct materials requisitions cards are filed in the work-in-process file. Where indirect material is budgeted, the indirect materials requisitions cards can be sorted by department and account, combined with previously punched budget cards, and used to produce a budget report showing actual, budgeted, and variance amounts.

FINISHED STOCK CONTROL

The biggest problem in controlling finished stock is accurately combining all the transaction details that affect the stock. To incorporate all this data and produce a report in detail by stock number as frequently as needed and up-to-date, is a difficult procedure by manual means. Punched cards can greatly simplify and speed up this work.

A card is punched for each transaction which affects the stock position. These include customers' orders, production orders, purchase orders, receipts, shipments, and all types of adjustments including cancellations, returns, and shrinkage. The card contains such details as item identification, quantity on hand, unfilled orders, quantity on order, and sales. The cards are proved and balanced to controls daily and filed by stock number.

Balance Card

In addition to these detailed transaction cards, the file contains a balance card for each item. At predetermined intervals, this file is used to produce a stock position report which shows the complete position on stock, both active and developing. As the report is being prepared, a new balance card showing all new balances is punched automatically. The report may include only active items and may be prepared as frequently as required.

The cards are available for numerous subsidiary reports such as production reports, sales analyses, and branch inventories.

BILLING—Many of the operations involved in billing can be performed before the customer's order is received. Often little more than printing the bill is left to be done at bill-

ing time. Neither manual nor key posting is necessary.

Customer Card File

A file of customer cards is set up, showing customer's name and address and any other predeterminable information such as credit data. When an order is received, a detail card is punched for each item. The detail and customer cards are combined to prepare the order. Duplicate copies serve as packing slips, and as warehouse, office, and salesman's records. When the order is ready for shipping, the same cards are used to prepare the invoice.

If the product is standard, a reservoir file of prepunched cards often can be used to provide the item detail. These cards contain description, quantity, price, and extension, and are filed by item and quantity denominations. One or more cards are selected from the file to add up the quantity ordered. It must be remembered that an item card need be punched manually only once. Duplicates for the reservoir file are prepared automatically.

If the product is received and issued in standard units, the reservoir file may become a stock file containing a card for each unit in stock. Receipts are recorded by adding cards to the file—sales by removing the corresponding cards. The removed cards are used to prepare invoices. Under this plan, the file represents current stock at all times and may be used to prepare stock reports. Under any of these plans, billing cards are further used for sales analyses, accounts receivable, or other reports reflecting shipments.

NEW MACHINES AND SERVICE BUREAUS—The past few years have seen a trend toward machines which are particularly adaptable to smaller organizations. The objective of the equipment manufacturers is to make office mechanization practical for more and more small concerns. This trend seems likely to continue.

Basically, the procedures described for standard equipment are followed in using the new machines. In this connection, for example, a recent field test indicated that more than 96% of all the work in a comprehensive billing application could be mechanized. With today's high office costs, no business, large or small, can afford to overlook the advantages of this kind of mechanization.

Even though a small concern's workload does not justify the full-time use of any automatic office machines, this does not mean it is precluded from taking advantage of the benefits of such machines.

Scattered throughout the country are service bureaus where a complete line of machines, together with a highly trained staff, can be hired by the hour, the day, or the job. These bureaus are constantly serving small manufacturers. Their jobs range from a complete payroll operation—including payroll registers, checks and earnings statements, tax returns, and labor distribution reports—to one-time physical inventory calculations.

ALL PAPERWORK NOT HANDLED BY CLERKS—It should be remembered that paperwork is not done by office personnel alone. Salesmen's reports, shop requisitions, production tickets, and many other similar recordkeeping jobs are too often an unnecessary burden on production personnel. Equally often, their paperwork results are painstakingly slow, inaccurate, and costly.

With manual methods the tendency is to spread or decentralize record-keeping and thus compound the inefficiency. Mechanization of records, on the other hand, promotes centralization and helps to eliminate hidden costs.

The use of automatic machines is not the complete answer to all office problems. When intelligently applied, however, they can provide benefits often impossible to obtain with an equivalent investment in other methods of improving paperwork.



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CROPLIFE, November 12, 1956



Doing Business With

Oscar & Pat



By AL P. NELSON
Croplife Special Writer

At the moment, the otherwise neat desk of Oscar Schoenfeld was practically covered with papers, mostly bills, and Oscar was figuring discounts. As he figured the frown on his pudgy face deepened. Now and then he would look up exasperatedly at his partner, tall, blue eyed Pat McGillicuddy who sat reading a farm magazine, his long legs on the wastebasket at the side of his desk.

Finally Oscar could stand it no longer. "Pat," he said sharply. "We have a lot of bills to pay, and, ah, this stack of overdue farmers' accounts is pretty long. You said last week you would go out and collect."

Pat frowned slightly, took his feet off the wastebasket. "Oscar, do you think it is good business to keep pestering our customers for money all the time? Most of them pay sooner or later anyway. I don't see why you get so hot under the collar about those bills."

Oscar bit his lips. "You don't see why I get mad about those bills, eh? We are in this business to make profit, ya?"

"That's right," Pat came back, "and when we go out and sell, that is where we make the sales and the profit, too. Selling is important. I was just readin' in this farm magazine

about a dealer who sold a farmer on the idea—"

"Selling!" interrupted Oscar bitterly. "To hear you talk, ah, selling is everything. Running a business right, collecting the money, that is just as important."

Pat's blue eyes looked levelly at Oscar. "Sure those things are important, too, but—no sales—then there is nothing to collect."

Oscar was not impressed by this type of logic. He began to sweat a little under the nose, which he always did when excited or angry.

"Huh, there is a lot you have to learn about business yet, nicht wahr? Where do you suppose all the money comes from that pays the salaries, and all the other goods?"

Pat grinned. "From customers, of course!"

Oscar shook his head stubbornly. "Only part of it," he said. "The rest comes right out of my noodle," and he pointed at his balding head. "I make money for us up here, too."

Now it was Pat's turn to look puzzled. "Now that is something I have never thought of, begorra. Tell me about it, Oscar."

Oscar flushed a little. "I have tried to tell you lots of times but you don't listen. Always you have your head filled so full of those sales ideas. Now, if we make from 5 to 10% net profit

a year on our investment, we think that is pretty good, don't we?"

Pat thought a minute. "Yes, I guess so."

Oscar pointed a pencil at Pat, and it was a very sharp pencil. His eyes were half closed and cold. "When I take a 2% discount on bills, look what I make for us!"

"What do you make?"

Oscar grunted. "What do I make? I make plenty. If we buy \$100,000 of merchandise, and I discount all the bills, ah, then I make \$2,000 for us just like that!" And he snapped his fingers.

Pat nodded slowly, admiration in his eyes. "That's nice goin', Oscar," he said. "I'm lucky I have a partner like you, I am."

"You are lucky!" Oscar intoned. "How about me, ah, with you spending, spending all the time?"

"Let's not get into that subject now," Pat said. "Tell me some more about how you make money for us."

"Ach, I will. What money I save on discounts we can use to buy other merchandise, sell it quick, and then discount again. I get the suppliers to stagger their billing dates, so I don't have to take the discounts all at once. Ach, that would break us. Some fellows give a discount if you pay in 10 days, otherwise it is net in 30 days. I watch that stuff carefully, nicht wahr?"

Pat frowned. "I guess you do, Oscar, but quit using those German expressions so much. I don't know if you're praising me or swearing at me."

"Praising!" Oscar blurted. "Ach, I should live so long." Then he went on, his grey eyes glowing with financial eagerness. "I watch those discounts so close every day, ah, I dream I am taking discounts. I also borrow money from the banker just so I can pay bills before the discount date."

"But that costs us money—to borrow from the bank!"

Oscar nodded. "Sure, it costs 6%. But if I borrow \$5,000 at 6% and use that to discount bills we make plenty of money, too."

"Very much?"

"Ach, plenty. \$5,000 at 6% is only \$300, Pat. And we can get it for a year. Then, I take that \$5,000 and pay the bills before discount time—especially the 10 day ones, and I keep using the saved money to pay other bills in 10 days or so. I save us about \$1,200 a year in that way by using the \$5,000 I borrow from the bank. The bank charges me \$300 and I save us \$1,200 with this money. How much profit is that, McGillicuddy?"

Pat thought for a moment. "Why, it's \$900, Oscar?"

Oscar nodded happily. "Ach, yes, that is the way I make money around here." And he stuck out his chest, then relaxed to pick up a stray paper clip from the floor.

"Well, if you can make so much money for us discounting bills by borrowing money for that purpose from the bank," Pat said, "why do we have to keep hounding our customers all the time to pay up their bills so fast, and thus kill future sales?"

Oscar got red faced again. "Ach, why?" he thundered, angry that Pat could not see the logic of his statements. "If you get off—off your—your chair there and collect, then we will have the money we own in here in the cash register. Then, we don't have

to borrow a cent from the bank at 6%. That's why. Then we can use our own money to discount all bills and we save the 6% the bank charges us now."

Pat sighed. "Well, you seem to have something there, Oscar, but I still can't see the business wisdom of pounding farmers over the head every day to get them to pay. It's hard to sell them anything else if they think you're after collections each time you visit them."

"I don't care. We are not in the banking business," shouted Oscar. "Why should farmers keep our money 30, 60, 90 and 120 days or more, and we not get a cent of interest for it? Let them go to the bank and borrow money for 120 days, and see what they would have to pay."

Pat got up. "It's lunch time now, Oscar, and I'm hungry. But one of these days I am going to give you a lecture on the importance of selling and also on retaining customer good will."

"I won't listen!" Oscar blurted out, giving his attention again to his papers. "I don't believe in all that blah—blah. This," and he pointed at his papers, "is what counts in a business. Pay the bills. Then you can look everybody right in the eye, nicht wahr?"

RURAL SCHOOLS

(Continued from page 9)

with information on what chemicals can be used to kill or control these pests.

Most certainly these colorful insect pictures could be used for display for more than one year. And many parents would certainly see these drawings, for the children would perhaps do some of the finishing work in their homes on such pictures.

I know a carpenter in a small town who has made a hobby of studying trees and shrubs. He can walk along any road or in a forest with friends and keep them highly interested with his identifications of trees and shrubs, how they grow and other data. He is often called upon by Boy Scout and other groups to take young people on such knowledge-seeking tours.

The alert farm supply dealer, too, can become an expert in tree and shrub identification, and add to the story, the chemical control methods for tree diseases. He will have no trouble getting farm youngsters, and sometimes adults, to accompany him on weekend tours like this.

These are only a few of the ways in which the alert farm supply dealer can be of service to his rural schools, the farm community and to his own business. Good will programs of this sort offer the opportunity to meet more people, render greater service and to win new customers.

Insoluble Zinc, Copper Fertilizers Do Good Job

MADISON, WIS.—Zinc and copper fertilizers can be applied to the soil in insoluble form and still do a good job, according to soil chemists at the University of Wisconsin. M. L. Jackson and L. E. DeMumbrum explain that fertilizers usually have to be in soluble form.

The soil scientists used infrared light and other soil chemistry techniques to find out how the insoluble forms of copper and zinc are used by plants and why they make satisfactory fertilizers. They found even the most "insoluble" copper and zinc compounds send forth a few ions in solution. As ions, the metals are free to be used by plants or combined with other materials.



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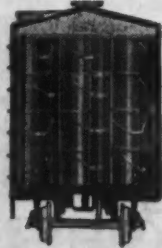
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FARM SERVICE DATA

Extension Station Reports

A University of Illinois farm management specialist reports that wheat yields have been boosted to as high as 70 bu. per acre on some Southern Illinois farms in recent years, by the use of improved wheat varieties, better fertilization and good management practices.

J. B. Cunningham said these results have been obtained in projects on 27 test-demonstration farms in six South-central Illinois counties in the past three years.

In this test-demonstration program, said Mr. Cunningham, the emphasis has been on total farm yield, rather than yield from a few acres on the farm.

Mr. Cunningham reported that among farmers with high individual yields were: Charles Lynch, of Edwards county, who averaged 65 bu. of wheat per acre on 42 acres; Ayers Buzzard, Fayette county, 56 bu. on 75 acres and Hanacle (Hanakul) Dunahoe, Clay county, 51 bu. on 36 acres.

The farmers said that a balanced fertilization program helped them get their high wheat yields. They used high analysis nitrogen and phosphate fertilizers, Mr. Cunningham reported. They added the fertilizer on the basis of soil tests.

Cold weather doesn't stop insects that thrive on stored grain, Harold Gunderson, extension entomologist at Iowa State College, says. The year-around trouble makers commonly found in Iowa grain bins are just as active in masses of grain when daily outside temperatures drop below freezing.

New life can be put into old alfalfa fields with a top-dressing of phosphate-potash fertilizer, reports the Middle West Soil Improvement Committee.

Many of these fields have produced abundant hay crops during the spring and summer. As a result, a heavy drain has been made on the soil's reserves of phosphate and potash. So replenishment is needed in the form of plant food.

How much fertilizer to add and what ratio to use can be determined by a soil test that will give an idea of the soil's reserves of phosphate and potash, the committee points out.

On many Midwestern soils, agronomists recommend adding a fertilizer mixture such as 0-10-30, or 0-9-27 at the rate of 300 to 500 lb. per acre. If a test indicates the soil is low both in phosphate and potash, then a ratio such as 0-20-20 may be profitable.

If a boron deficiency occurs, some soils men advise applying about 30 lb. of borax per acre in addition to the phosphate-potash fertilizer.

One of the big benefits of top-dressing alfalfa fields in the fall is that the plant food helps the legumes store up nutrients in their roots. Strong, well-fed roots anchor themselves more solidly in the soil and come through severe winter weather in better shape. They are able to withstand heaving during alternate periods of freezing and thawing.

Corn yields have been increased as much as 22 bu. per acre by loosening

the subsoil to a 20-inch depth and adding fertilizer containing nitrogen, phosphate and potash in Purdue University tests.

As a result of the soil-loosening operation corn roots are encouraged to penetrate deeper into the ground and make use of moisture reserves in the subsoil, says the committee. The fertilizer is applied in a vertical band from the plow sole to the lowest depth of the soil-loosening operation.

Helmut Kohnke and A. R. Bertrand of the Purdue agronomy staff, point out that loosening the subsoil is particularly helpful in maintaining corn yields when rainfall is scarce. In such years, the soil moisture is often not sufficient to give maximum yields. Unless the subsoil has been loosened, crop roots do not penetrate deep enough to make use of the subsoil moisture.

When fertilizer is placed in the loosened subsoil, the plant roots will concentrate in the grooves thus formed. Root growth then is thicker in the subsoil. The roots can reach needed moisture.

The Purdue agronomists report that the best time to loosen the subsoil is in the late summer or early fall, in preparation for planting corn the next spring. In the fall, subsoils are usually dry and shatter more easily, they point out.

An investment of \$17.75 in fall-applied fertilizer returned more than \$70 profit per acre in increased hay yields on an old alfalfa field top-dressed with phosphate-potash fertilizer in a demonstration on the Roy Slough & Sons farm in Dane County, Wisconsin. Alfalfa hay yields were increased 4,700 lb. per acre over a two-year period on an old field top-dressed in the fall with 500 lb. of 0-20-20 fertilizer, plus boron.

C. J. Chapman, University of Wisconsin extension soils specialist, estimates the value of this extra hay at \$70.50, figuring the alfalfa at \$30 per ton. Thus the fall top-dressing of phosphate and potash paid off at the rate of nearly \$4 for each \$1 invested.

Dr. Chapman reports that not only did the fertilizer boost hay yields, but it also added to the life of the alfalfa stand. Part of the field not top-dressed had thinned out, was full of weeds and had to be plowed up.

University of Minnesota soils specialists report that fall applications of fertilizer are just as effective in boosting crop yields as plant food put on in the spring.

"Results of Minnesota tests have shown that yields of various crops were essentially the same, regardless of whether the fertilizer was put on in the fall or in the spring," said Dr. J. M. MacGregor, University of Minnesota soils specialist.

In these tests, said Dr. MacGregor, nitrogen, phosphate and potash have been applied by themselves, or in combination with each other on several different crops. The tests were made mostly on medium-textured soils.

Dr. MacGregor said that the tests showed little or no apparent loss of nutrients from fall-applied fertilizer once it was worked into the soil. In

the case of coarse-textured sand soils, he said that research work is still underway to determine the capacity of these sandier soils to retain the fertilizer.

Some Minnesota farmers report that fall-fertilized corn has sometimes out-yielded spring-fertilized corn by about five to eight bushels per acre. Alfalfa hay yields have been a ton higher per acre on fall-fertilized fields, as compared with spring-fertilized fields.

Midwestern agronomists report that wheat is one of the most responsive crops to fertilizer. These research men point out that wheat needs a well balanced supply of nutrients. In some Midwestern states, the college recommendations advise adding as much as 500 lb. per acre of plant food to winter wheat seeded in the fall.

As an example of how wheat responds to fertilizer and good management methods, Illinois agronomists report increases of as much as 14 bu. per acre, when winter wheat had a fall application of starter fertilizer, plus nitrogen.

Nebraska soils specialists state that wheat yields increased more than 12 bu. per acre, when needed nitrogen and phosphate fertilizers were added according to soil tests.

Pasture renovation has helped many farmers double or triple the

Better Selling

Richer Sales Fields for Dealers

number of dairy cows they can carry per acre. It can transform rundown fields into high-yielding, profit-making pastures.

This helps farmers produce the roughage their cows need. And, it lets them save on feed bills by cutting down on grains and proteins needed to maintain milk production, says O. T. Coleman, University of Missouri extension soils department.

A good renovation program involves replacing weak, weedy sod with high producing stands of legumes and grasses, thus reducing the washing and gullying from rains and snows.

The program requires the proper use of fertilizer according to soil tests turned under or worked in deeply so as to build up the soil's productivity so it can feed the forage crops.

Pasture renovation may cost as much as \$25 per acre, depending on how much fertilizer and seed are needed and what needs to be done to control erosion until the grass gets established. But, it's an investment that can pay off in high profits per acre, through higher yields, a greater cattle-carrying capacity, and increased production per acre, Mr. Coleman says.

INDIANA SOIL TESTS

LAFAYETTE, IND. — Less than 10% of Indiana's farmers use soil tests as a guide for fertilizing and liming, reports R. D. Bronson, Purdue University agronomist.

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Better Selling

Richer Sales Fields for Dealers

What's Been Happening?

This column, a review of news reported in CROPLIFE in recent weeks, is designed to keep retail dealers on the regional circulation plan up to date on industry happenings.

Dr. Earl Butz, assistant secretary of agriculture, told the Middle West Soil Improvement Committee in Chicago, that the fertilizer industry stands to gain as much as 350,000 tons of fertilizer in extra sales through the soil bank.

Lamar Ratliff, 17-year-old Mississippi farm boy, harvested 257.1 bu. corn from a single acre, for his second-best try in a number of years. (His record was 304 bu. in 1955.)

A new parasitic weed, Striga, has been found in South Carolina, the USDA announced. This weed, if allowed to spread, can cause great damage to corn and sugar crops.

A new model state fertilizer bill, which would change fertilizer guarantees for phosphorus and potassium from an oxide to the elemental basis, was approved by the Association of American Fertilizer Control Officials at its annual meeting in Washington. J. D. Patterson, Salem, Ore., was elected president of the group.

E. O. Burroughs, Jr., Royster Guano Co., Norfolk, Va., was named chairman of the fertilizer section of the National Safety Council . . . Harry J. Fisher, New Haven, Conn., was elected president of the Association of American Pesticide Control Officials.

The meeting of the fertilizer industry round table brought out up-to-date information on modern plant food manufacturing techniques during its three-day convention in Washington, D.C. About 300 persons were in attendance to represent all segments of the manufacturing industry.

A new name, "The National Fertilizer Solutions Assn." was adopted to designate a new group formed by the consolidation of the former National Nitrogen Solutions Assn. and a group of liquid complete fertilizer makers. The convention was held at Sioux City, Iowa, with some 300 persons registered.

Two new antibiotics, Anisomycin and Griseofulvin were successful in controlling powdery mildew of snap beans in greenhouse tests by the USDA, it was announced.

A U.S. Department of Agriculture survey turned up additional areas in New Jersey, Pennsylvania and New York that will need gypsy moth control measures in 1957. Plans call for from two to four times as much insecticidal spraying in 1957 as in 1956. . . Consignment selling and guaranteed merchandising sales were condemned during a session at the annual meeting of the Carolinas-Virginia Pesticide Formulators Assn. in Pinehurst, N.C.

Chemical Lime Co. of Oregon planned to build a \$1,250,000 chemical lime plant at Portland, Ore. Available lime is sufficient to supply the needs of the Pacific Northwest for the next 60 years, a company spokesman declared. Production will be 75,000 tons a year.

Grasshoppers posed a serious threat in New Mexico for 1957, on 2½ million acres of rangeland, and 196,000 acres of croplands in the state. A wide area of the state is affected in the insect threat.

The U.S. Tariff Commission reported that production of synthetic organic chemicals in 1955 was up 22% over the output of 1954. Pesticides and other organic chemicals exceeded the production of 1954 by 21%, the report said.

That unusually heavy populations of grasshoppers are present in Colorado, was found in recent surveys in the state. Some 438,000 acres of cropland were said to be infested with the insect, giving rise to predictions that next year will see major infestations. As always in making such predictions, the weather must be taken into consideration, according to Gordon Mickle, A&M College entomologist, but under conditions favorable to the development of grasshoppers, 1957 could see unusually heavy infestations.

The National Association of Commissioners, Secretaries and Directors of Agriculture met in San Francisco. The twin problems of pest eradication and the control of insecticide residues on harvested crops were covered by speakers.

Sugar beet acreages for the 1957 crop have been increased, the USDA announced. The national allotment is set at 885,000 acres as compared to 850,000 acres in 1956.

The Re-Mark Chemical Co. began a \$100,000 modernization program to increase its fertilizer output five-fold, the company said. Located at Homestead, Fla., the firm recently purchased the R. W. Brown fertilizer plant at Goulds, Fla. This new subsidiary will be known as Hurricane Fertilizer Co.

A report by the U.S. Bureau of Mines confirmed earlier reports by the American Potash Institute that production of potash was up slightly in 1955. The government report stated that consumption of potassium salts was up 4% in 1955 as compared to the previous calendar year.

The American Chemical Society was told at its 130th national meeting that if farmers would use fertilizers at levels recommended by state experiment stations, the extra income from this means would be more than government supports at 100% of parity. Dr. Russell Coleman, executive vice president, National Plant Food Institute, made the statement. Other speakers reported on tests made on various pesticides and plant foods at the Atlantic City, N.J., meeting.

Tests of aerial fertilization of forests were reported on by Rutgers University, New Brunswick, N.J. Applying a complete fertilizer on an 11-acre stand of red pine, caused the 28-year-old trees to mature more rapidly. Tests were made in cooperation with the Nitrogen Division, Allied Chemical & Dye Corp., New York. Fertilizer used was a 12-12-12 grade.

OVER THE COUNTER

(Continued from page 9)

that customers are often more interested in what somebody thinks of an item than in specific facts about it. Many times the salesperson who reminds a customer that an article is 'popular' or 'right' will have better success than someone who outlines physical specifications.

Stick to Merits Of Own Products

"In supplying facts, the best sellers stick to the merits of their own products and avoid discussions of a competing item's shortcomings. They are conversant with product features, but they don't burden customers with more information than is requested.

"Meeting objections takes tact and understanding. Valid ones must, of course, be admitted as fact. Competent salespeople usually answer them by pointing out the article's compensating virtues. If the customer simply indicates a preference for a competing brand the reply may be, 'Perhaps you'd be wise to try our brand so as to make a comparison. It's a very fine product and many people, once they've used it, like it better than anything else.'

Don't Contradict Unless Questioned

"Even when a customer is entirely wrong, the expert salesman will not contradict or correct unless specifically asked for a confirmation of facts or an expression of opinion. Agreement helps to dissipate sales resistance, to avoid argument and to establish an atmosphere conducive to making the purchase.

"Proficient sellers seek opportunities to suggest additional merchandise after a customer has made an initial purchase.

"Top-flight sales personnel try to have customers leave with merchandise which is suited to their wants and pocketbooks and with the feeling that their patronage is welcome and sought in the future. Frequently used are parting remarks like, 'Many thanks, Mr. Madison, I'm sure you'll be pleased with this item. It's always a pleasure to help you; do come in again soon.' Sometimes a friendly comment makes the difference between a repeat customer and one who goes somewhere else the next time."

Missouri Farmers Using Higher Analysis Goods

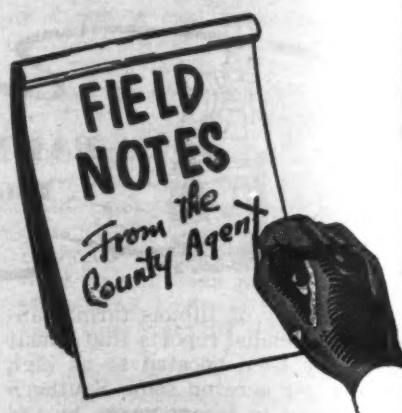
COLUMBIA, MO.—Missouri farmers continued their move to higher analysis fertilizers during the 1955-56 fiscal year, says O. T. Coleman, University of Missouri extension soils specialist.

Nitrogen, phosphate, and potash use increased by nearly 3% during the past year when compared to the previous year. The 574,000 tons of processed fertilizers sold in Missouri contained 207,000 tons of actual plant nutrients. This was an increase of 5,430 tons over the amount used in 1954-55.

This doesn't include rock phosphate. During the past year, rock phosphate use increased from 105,000 to 236,000 tons for a 124% jump. Nitrogen use was increased by 2%, phosphate by 38%, and potash by nearly 8%.

The use of all processed fertilizer in Missouri at the year's end was 99.4% of that used in the previous year. The average nutrient content of fertilizers was 36% in 1955-56 as compared with 35% the previous year.

CROPLIFE, November 12, 1956



By RAYMOND ROSSON

County Agent, Washington County, Tenn.

Nov. 16-22 is "Farm and City Week." They are partners in progress. We hope all of the dealers, especially those belonging to civic clubs, have already named committees and planned activities to make sure this year's observance is a success in every community.

From an over-all viewpoint the second national observance of Farm-City Week promises to eclipse the initial attempt in many ways. Naturally we have gained by experience, by working together, and by the knowledge of what can be done when people and organizations genuinely interested in bringing about a better understanding between farm and city groups dedicate themselves to doing something about it.

To Kiwanis International, the coordinator, is due a great deal of credit for the success; but they are not the only ones to point out the tremendous contribution made by agricultural leaders, the farm youth organizations and the many civic clubs. At last count there were considerably more than a hundred organizations represented on the national committee which sponsors "Farm-City Week."

It is really amazing how much misunderstanding exists about the relationship of farm prices to farm costs, especially among the folks in the larger towns and cities. No group has succeeded in making this clear to the American public.

We wonder sometimes, "just what would it cost the American public if we had a scarcity of food?"

Remember . . . the farm problem is as much a city problem as it is the farm problem.

Carry-Over Value Of Fertilizer Shown In Missouri Plots

COLUMBIA, MO.—The efficiency of the soil as a bank in which to save up plant food for future conversion into the legal tender of marketable farm products has been proved by Missouri Station research in more than one recent year of drought.

Carry-over of fertility from the dry season of 1954, for example, accounted for corn yields around 70 bu. an acre on the University South Farms near Columbia—without additional treatments—in 1955.

Retained in the soil under the severe limitation of moisture during the former year, 100 to 300 lb. of nitrogen gave yields just as high as those obtained from similar plots receiving liberal additions of nutrients in the latter year.

This carry-over or delayed release of fertility was especially effective on plots with considerable clay in the subsoil, indicating that, where liberal applications of nutrients are made for corn, the time of application is much less important than formerly believed.

Timely rainfall, on the other hand, as in 1955 in the area around Columbia, was a most important factor in this experiment.

ANHYDROUS MEETING

(Continued from page 1)

about 21%. Now anhydrous ammonia is the leading source of nitrogen used by American farmers. "I do not think we would be stretching the facts very much if we should give credit to the AAI for a large part of this accomplishment," he continued.

"While farmers probably have many just complaints about the low prices they are receiving for their products, they are today enjoying not only an abundant supply of nitrogen, but in the form of anhydrous ammonia they are buying it at a lower price than ever before in history. In addition, farmers are getting their nitrogen in a form that requires very little labor in handling and applying. After being applied, the ammonia remains in the soil until used by crops, ready to help produce more profitable crops," Mr. Wooten declared.

A statistical paper prepared by J. Richard Adams and Walter Scholl, U.S. Department of Agriculture, Washington, was presented. Dealing with nitrogen fertilizer materials for direct application, the paper said that the amount used in the U.S. and territories in the fiscal year ended June 30, 1955, was 1,960,536 tons, almost triple the 701,070 tons used in 1946. In 1946, the paper said, less than 50% of the use was in the form of separate materials, whereas in 1955, separate materials comprised nearly 60% of the amount used.

"Ammonium nitrate has consistently supplied more direct application nitrogen since 1946 than any other individual material," it was pointed out. "Anhydrous ammonia became the second largest source in 1952, supplying 137,983 tons of nitrogen, and its use has continued to increase. By 1955 anhydrous ammonia was being used in Puerto Rico and every state except Maine, New Hampshire, Vermont, Massachusetts, and Rhode Island."

"The total consumption was 353,81 tons or 290,337 tons of nitrogen, an increase of more than 100% in the last 3 years. Nitrogen solutions, including aqua ammonia, also have risen in prominence in the last few years and Hawaii, Puerto Rico, and all but 11 states consumed 340,574 tons (84,979 tons N) in 1955. The increased use of anhydrous ammonia and other liquid sources of nitrogen has been possible because of the expansion of the ammonia industry."

"There were 9 domestic synthetic ammonia plants with an estimated annual production capacity of 377,000 tons of nitrogen previous to World War II. By 1957 this capacity will be 3,554,000 and there will be 16 plants with at least one each continental area, except the Mountain Region," the authors reported.

Fred Stewart, Agricultural Ammonia Service, Santa Paula, Cal., is the new president of the AAI, to succeed Gen. Wooten. Other officers elected were: Paul Duesterhaus, Duesterhaus Farm Supply Co., Fowler, Ill., first vice president; Charles Corken, Corken's, Inc., Oklahoma City, Okla., re-elected second vice president; Mike H. Carter, Farmers Supply Cooperative, Greenwood, Miss., re-elected secretary; and Murray O. Rasberry, Delta Butane Gas & Fertilizer Co., Helena, Ark., re-elected treasurer. Jack F. Criswell, Memphis, Tenn., continues in the position of executive vice president, and Frank E. Jordan was introduced as executive assistant of the institute.

New directors elected were Frank J. Archibald, St. Clair Grain & Feed Co., Chatham, Ont., Canada; Herbert A. Buehler, Buehler Tank & Welding Co., Los Angeles; Felix Harvey, L.

Harvey & Sons, Kinston, N.C.; H. B. Howe, Howe Ice Machinery Co., Chicago, Ill.; R. C. Singletary, Jr., Blakely Peanut Co., Blakely, Ga.; and C. J. Struble, Standard Oil of Indiana, Chicago. Re-elected to the board were Miller Carpenter, Missouri Growers Assn., Carrollton, Mo., and Mr. Stewart. Two directors designated by the board to serve with the new officers on the executive committee were Gen. Wooten and J. M. Porter, nitrogen department, agricultural chemical division, American Cyanamid Co., New York.

The membership selected Chicago for its 1958 convention site. Last year, the institute agreed to meet in Little Rock, Ark., in 1957. The convention date for both years will be set later, but it will fall between Thanksgiving and Dec. 10.

American Agricultural Chemical Announces Personnel Changes

NEW YORK—The American Agricultural Chemical Co. has announced the following personnel changes:

J. E. Morgan is production superintendent for the firm's fertilizer plant at London, Ontario, Canada. Formerly he was superintendent of the Port Hope, Ontario plant. S. J. Thompson succeeds Mr. Morgan as superintendent at Port Hope.

D. W. Newbauer, formerly assistant superintendent at the Fulton, Ill. plant, is the new production superintendent at Cairo, Ohio.

G. E. Richardson, formerly superintendent at the Columbia, S.C. plant, has been named superintendent at the Charleston, S.C. plant. C. L. Harris, formerly assistant superintendent at Pierce, Fla., becomes superintendent at Columbia.

J. D. McMurray has moved from assistant manager of the Carteret,

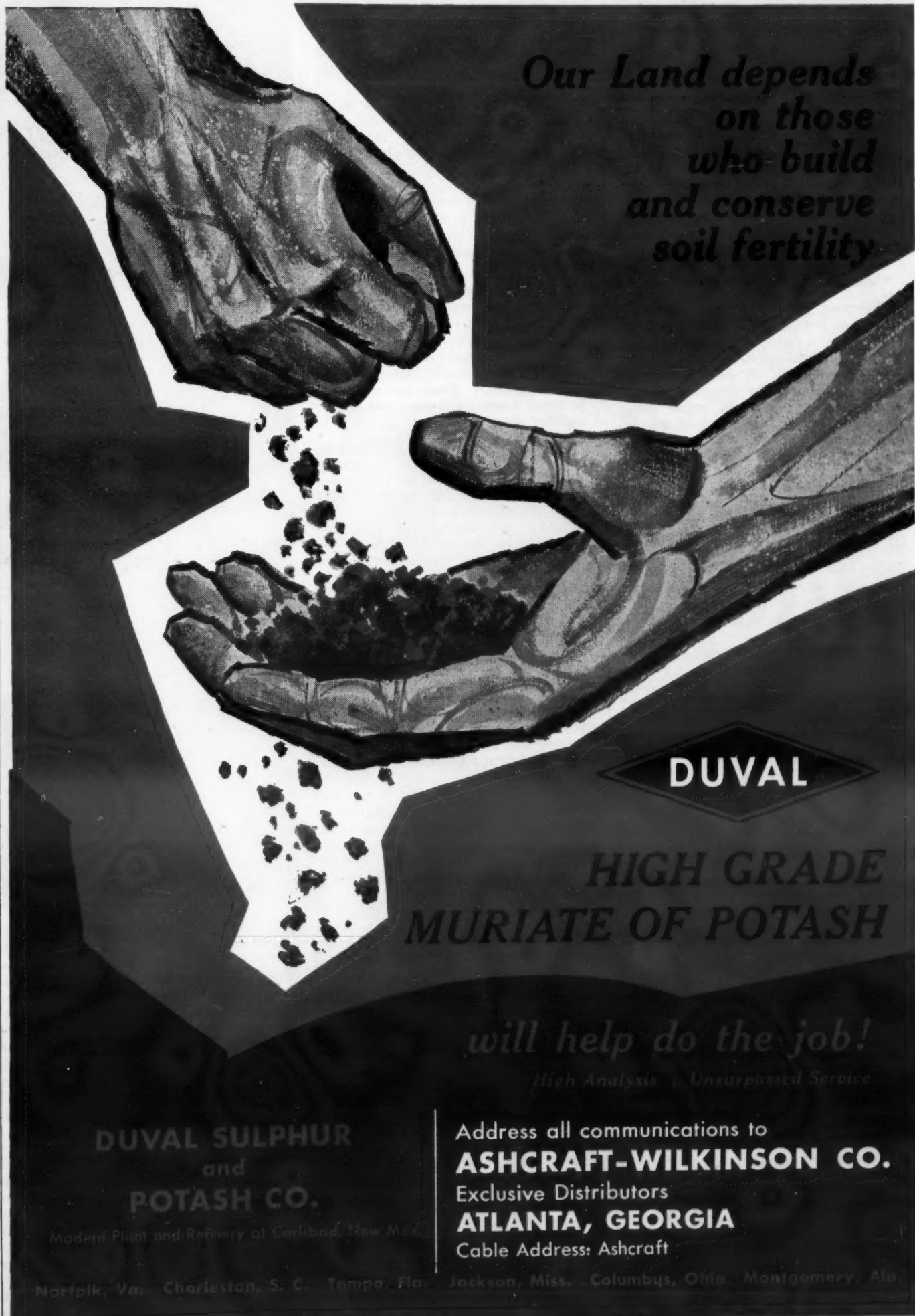
CROPLIFE, November 12, 1956—17

N.J. sales office to the home office fertilizer sales department in New York. Edgar B. Stalnaker of Baltimore, Md., is the new assistant sales manager at Carteret.

F. H. Herold has been named chief chemist of the chemical control department laboratory at the East St. Louis, Ill. fertilizer plant. The laboratory also serves plants at Humboldt, Ia. and Fulton, Ill.

Perfect Safety Records Achieved by Nine Plants

NEW YORK—Perfect safety records for one or more years were reported this month at nine plants of the American Agricultural Chemical Co. Plants with no lost time injuries are at Henderson, N.C.; Spartanburg and Columbia, S.C.; Pierce, Fla.; Chambly, Quebec, Canada; Three Rivers, N.Y.; Norfolk, Va.; Cleveland and Cairo, Ohio.



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ELEMENTAL VS. OXIDES

(Continued from page 3)

groups who do not have to grapple with the problem at the grass roots.

What about the reaction of the National Association of County Agents, the vocational agriculture teachers and, yes, the farmers themselves? I understand that the leaders of the Farm Bureau, The Grange, and other national farmer organizations have been contacted. Has an expression of the feeling of these groups been obtained?

In my contacts, I find that notwithstanding the recent publicity, many members of the fertilizer industry do not know that this change is being considered seriously. Of those who have heard of this proposal, I am convinced that a vast majority of them are opposed to the change.

This belief is substantiated by a number of informal industry surveys made in the past on this subject. To what extent industry members in each state will actively oppose this change cannot be ascertained at present. It may be that such a vast majority of the agricultural leaders are favorable to it that industry in most states will acquiesce without serious opposition.

The principal theme of my discussion to the control officials is that they be sure before making the move that there is enough support in each state to get the necessary laws changed. My appeal and primary reason for discussing this subject is to avoid what might occur if some states should make the change and others do not.

Suppose, for example, that the states of North Carolina and Georgia made the change but that opposition in South Carolina was strong enough to prevent making such a change there. It is easy to visualize what a chaotic condition this would cause not only among members of our industry who operate across state lines, but also among the control officials who enforce the law and statisticians who try to keep a record of fertilizer movement. Merely being sure that most of the states will go along is not enough. Each control official must be sure that his state will definitely make this change at the target date. The alternative to this is chaos.

Therefore, we need more reaction from down on the farm. We need the reaction of the plant food dealer. Will the elemental change simplify his explanation of the experiment station recommendations to his customers and will it increase his business? Dealer education is a continuing problem for both the industry and the experiment stations.

There are few fertilizer dealers as such. Rather they are feed dealers, tobacco warehousemen, farmers, or seedsmen who handle fertilizers as a sideline. By and large, their interest in the technical as-

pects of plant food is not great. Yet, many surveys have shown that the fertilizer dealer has a greater effect upon the farmer in his use of fertilizer than does any other group! The change-over would not necessarily mean uniformity, simplicity, and accuracy in the dealer's attempts to teach the farmer how to better use the fertilizer with which he is already familiar. In my opinion, any move to complicate the dealer's business, however temporary the complication, would not gain his support in the legislature.

Today American agriculture is not without trouble. One of the principal ways in which the American farmer can be led out of his predicament is to follow the experiment station recommendations in reducing his cost of production. Fertilizer is one tool at the disposal of all farmers. At this time, more than ever before, every ounce of energy available among agricultural workers and among members of the fertilizer industry should be devoted toward "selling" better farm practices.

Regardless of "how easy" it might be to make the change-over to the elemental basis, it will require a major educational effort on the part of those contacting the farmer. At this time, could not the efforts of our agricultural leadership accomplish more by directing it toward proper fertilizer use rather than toward an explanation of the elemental change?

The more one considers the numbers of people potentially involved or affected by a change to the elemental basis, the longer the list grows, coming right on down to the garden supply dealer and the suburban gardener. There are millions of these home gardeners and more coming along every day.

Now then, what of the control official's own responsibility in seeing through the changes in his respective state laws? According to the report of the committee to consider the advisability of changing guarantees to the elemental basis, the report prepared by the fertilizer committee of the Soil Science Society was sent to each control official, and a poll was taken to determine the officials' attitude on several questions involving this change.

Only two states could change without legislation, and of the 41 states returning the questionnaire, 18 were not sufficiently enthusiastic to poll their own control group as to those favoring and those not favoring. Four states said that "all" persons in their group favored. One said "all" had no preference, and in the 18 states remaining, 41 people favored the idea, 27 opposed, and 10 had no preference. Certainly, this is a far from enthusi-

(Continued on page 23)

Ohio Meeting Date Is Set for Dec. 13-14

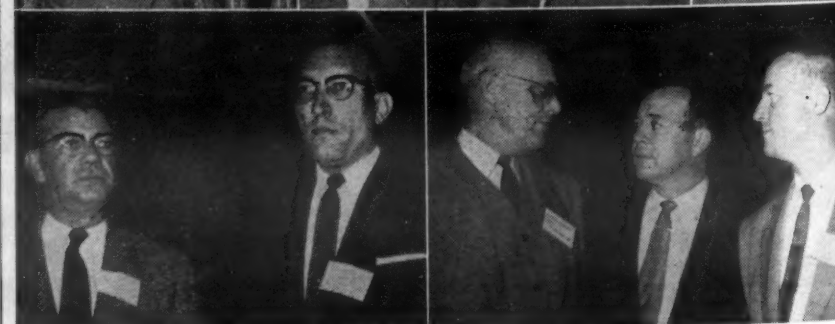
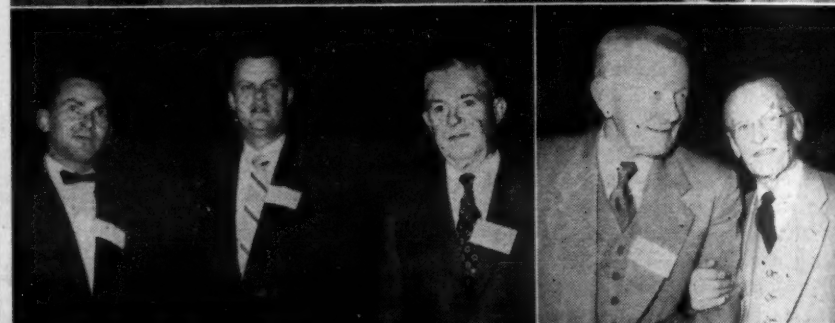
COLUMBUS, OHIO—Dates of the Ohio Fertilizer and Lime Conference have been announced by Gordon J. Ryder, extension agronomist at the Ohio State University college of agriculture.

The conference will be held Thursday afternoon and Friday, Dec.

13 and 14, he has announced. Place of the meeting will be Hearing Room No. 2 in the State Office Building, Columbus.

PERSONNEL MANAGER NAMED

LOS ANGELES, CAL.—James Smith has been appointed personnel supervisor at the Los Angeles office of American Potash & Chemical Corp.



AT MIDDLE WEST SOIL MEETING—A record crowd was attracted to the 18th annual meeting of the Middle West Soil Improvement Committee in Chicago Oct. 25. Among those present were numerous leaders in the fertilizer industry. Through courtesy of the MWSIC, here are photos of some of the personalities on hand for the meeting at the Sherman Hotel. In the top photo are officers and directors of the group. They are: (standing, left to right) Zenas H. Beers, executive secretary; G. H. Kingsbury, retiring treasurer; W. W. Venable, E. T. Potterton and Merle Blue, directors. Seated are L. E. Quiram, treasurer; Richard E. Bennett, president; R. G. Fitzgerald, vice president and W. M. Newman, retiring president.

Second row: Mr. Bennett, Farm Fertilizers, Inc., Omaha, Neb.; E. R. Martin, Miami Fertilizer Co.; John Zigler, International Minerals & Chemical Corp.; and James L. Schell, Kingsbury & Co. Dr. Russell Coleman, executive vice president, National Plant Food Institute, Washington, D.C., and Dr. Werner Nelson, American Potash Institute.

Third row: Howard Kamin and R. T. Corl, Darling & Co. and T. E. Bradley, Potash Company of America. C. E. Littlejohn, U.S. Potash Co. and Nelson T. White, Smith Agricultural Chemical Co.

Fourth row: Mr. Beers making his report before the group; H. H. Tucker, Sohio Chemical Co., Lima, Ohio; and A. R. Mullin, Indiana Farm Bureau Co-op Assn. Dr. Earl L. Butz, assistant secretary of agriculture, Washington, D.C., addressing the convention.

Fifth row: R. G. Fitzgerald and R. W. Brun, Smith-Douglass Co.; and Mr. Bennett; Dave Van Aken, Spencer Chemical Co.; and Frank Nelson, Rath Packing Co.

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USDA EXPERTS WARN . . .

Witchweed Can Destroy More Crops Than European Corn Borer If Left Uncontrolled

WASHINGTON, D.C.—Further information on the discovery in the Carolinas of witchweed, an insidious weed parasite that destroys the roots of certain crops, has been issued by the U.S. Department of Agriculture.

The news of the weed's being found was published last week (CROPLIFE, Nov. 5, page 1) but all of the details about the plant's destructive properties and its habits were not available at that time.

USDA says that the weed, *Striga asiatica*, was found in more than 40 scattered locations in three counties of North Carolina and four counties of South Carolina. It has been identified in Bladen, Columbus, and Robeson Counties of North Carolina, and in neighboring Dillon, Horry, Marion, and Marlboro Counties of South Carolina. So far as the Department now knows, the weed's discovery in these areas is its first reported occurrence anywhere in the Western Hemisphere.

"Witchweed does damage below ground, penetrating the roots of the host plants on which it lives and depriving them of nutrients and water," USDA explains. "The parasite may also inject into the host-plant roots some substance that interferes with normal growth of these plants."

Scientists of the state agricultural experiment stations, extension service specialists, and state regulatory officials in North and South Carolina, working in cooperation with USDA's agricultural research service, are taking immediate steps to determine the extent of witchweed infestation. Plans are being laid also for research aimed at making next season's control measures against the pest as effective as possible.

"This harmless-looking weed—it seldom grows more than a few inches high—is a scourge of corn and sorghum in South Africa and a serious pest of rice, sugarcane, and other crops in the Far East," the USDA bulletin continues. "The Union of South Africa has reported that it does more damage to corn in that country than fungous diseases and insects combined."

USDA scientists believe that if witchweed became widespread it might be capable of destroying more corn in the United States than the European corn borer, whose depredations cost farmers more than \$80 million a year. The parasitic weed could also attack summer-grown grains, sorghums, sugarcane, rice, and pasture grasses in this country.

The weed has caused severe damage in the few corn fields it has infested in the Carolinas. It has been found also in fields planted to other crops, along roadsides, and on vacant land. Although witchweed has been observed in tobacco, peanuts, beans, peas, sweetpotatoes, and other crops not related to grasses, it does not parasitize these crops.

However, crabgrass or other grasses growing in fields of non-susceptible crops can make witchweed seeds lying dormant underground germinate and produce new plants that serve to spread the infestations. A single witchweed may produce up to half a million microscopic seeds. These tiny seeds are capable—much like the spores of a rust fungus—of easy distribution by wind and other means.

Witchweed seeds cannot germinate without the help of suitable plants. They may lie dormant in the ground for years. Germination occurs only when the seed comes near or in contact with the roots of corn and cer-

tain other plants, mainly grasses, which evidently secrete some substance that causes the weed seed to begin growing. But even in the presence of these host plants, witchweed seeds normally remain dormant for about 18 months.

After germination, the roots of the witchweed each develop a bell-shaped sucking organ—called a "haustorium"—which penetrates a nearby root of the host plant. These suckers gradually plug the host plant's vascular system, preventing it from getting nutrients and water from the soil. A plant so parasitized slows in growth and soon shows acute symptoms of drought, even when the surrounding soil is quite moist. Most plants attacked by witchweed die within a few weeks after symptoms of wilting first appear.

For about a month after its seed germinates, the witchweed grows en-

tirely underground, often several inches below the soil surface, living off its host. Then it emerges from the soil as a bright green plant.

A month or so later, the weed puts out small flowers, usually bright red but sometimes white or yellow. The first flowers appear near the base of the plant and others bloom later higher up. Seeds of the lower flowers are often mature by the time the higher flowers bloom. Most witchweed plants do not grow taller than 8 or 9 inches, but they may range up to 18 inches.

Within a month after the first flowers open, their seed pods burst and scatter the tiny seeds, which are almost too small for the eye to see. The life cycle of the weed, from germination to release of mature seed, thus takes 3 to 4 months.

Witchweed seems to prefer light soils, considerable moisture, and warm temperatures, but in South Africa it has shown ability to grow under a wide range of soil, moisture, and climatic conditions.

The chemical weed-killer 2,4-D will destroy witchweed plants found above ground, but spraying with this chemical is not expected to have any effect

CROPLIFE, November 12, 1956—19

on dormant witchweed seed lying below the soil surface.

The likelihood of drift damage from 2,4-D sprays in adjoining fields of cotton, tobacco, and other crops that are easily injured by the chemical may limit its use against witchweed in the present areas of infestation. However, the feasibility of using various chemical weed-killers and soil fumigants to eradicate witchweed is being explored intensively by scientists of the affected states and USDA.

One of the control measures against this weed parasite that is widely used in South Africa is the planting of "trap crops"—non-susceptible plants that are not attacked by witchweed but that nevertheless have roots able to cause dormant seeds of the pest to germinate. Plants of this type include peanuts, soybeans, and cowpeas.

Since seeds of this pest lie dormant in the soil for about 18 months, and since only those seeds lying against or close to the roots of the trap crops will be made to germinate after the dormant period, South African researchers recommend growing trap crops for 4 or more years in succession to do a thorough job of controlling the weed.

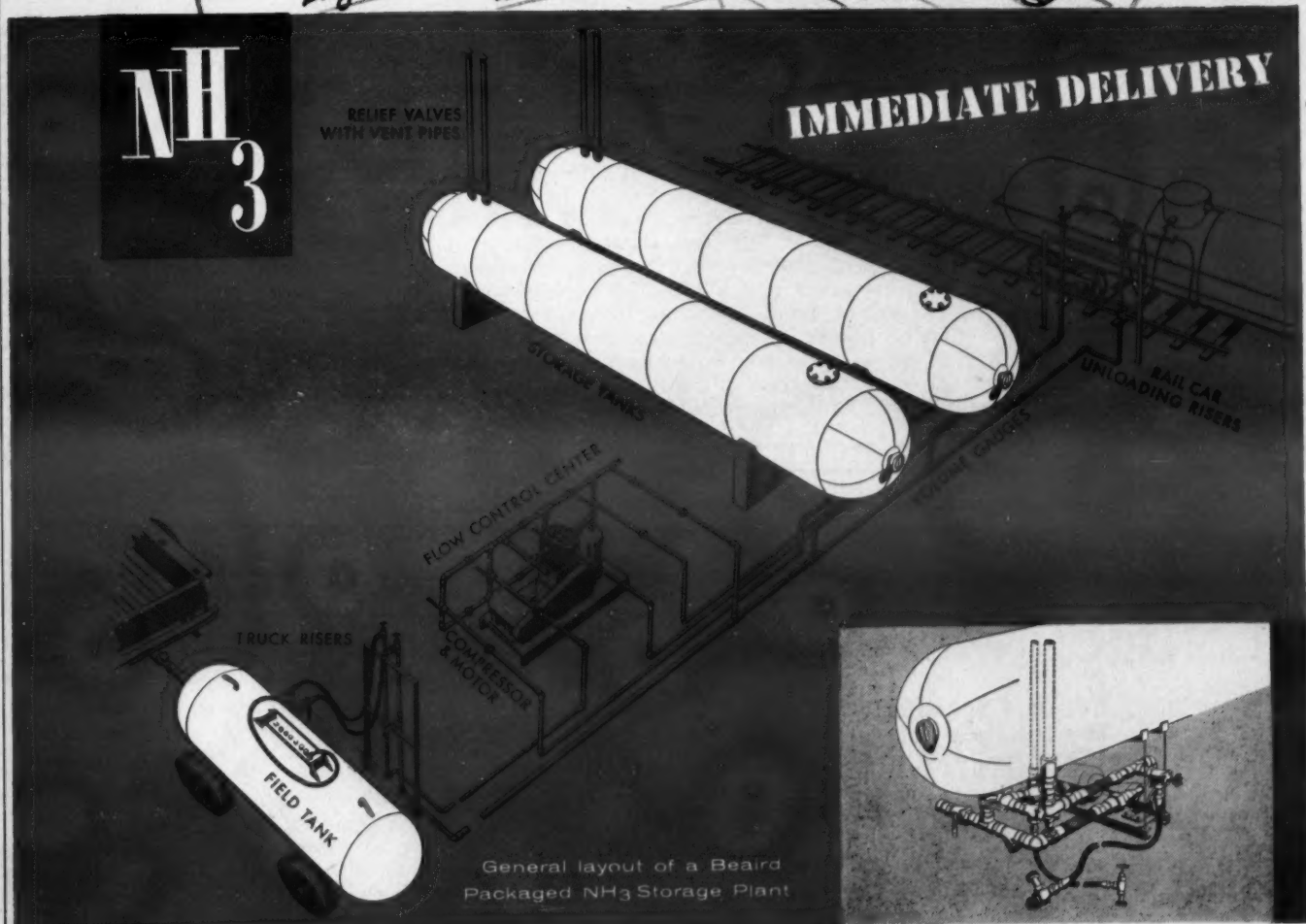
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CANADIAN MEETING

(Continued from page 1)

to the question of why farmers do not use more chemical aids in their work, Mr. Thomson submitted, lies in the saying often heard, "I'm not farming as well as I know how to farm, but only as well as I can afford to farm." He added that "if you are not really familiar with the hazards of farming in western Canada, it may be hard to understand why a farmer neglects to use a chemical when research shows so plainly just how much he has to gain by its use. The farmer will look at it from a different viewpoint. He knows that the increase in yield will more than pay for the cost of the chemical. But he also knows that he must harvest that crop with its increased yield to justify the additional expense.

"At the time of spraying he already has a lot of money tied up in that crop. Just how much more is he justified in investing in it? At the time for spraying, in late June, the farmer's pocketbook is nearer to being empty than at any other time of the year. He has a crop in the early stages upon which a great deal depends. If he is to remain financially secure, each acre of that crop must provide cash returns to meet the obligations of taxes, fuel, labor, depreciation, repairs, insurance, seed and other costs which altogether total some \$15 per seeded acre.

"All of these costs must be met whether he harvests the crop or not. If his pocketbook is empty, as it usually is at this time, is it not natural that he will think twice before he invests another 60¢ to \$1 an acre in that crop when there are so many things that can happen to it before harvest?"

The farmer limited most of his talk to the subject of herbicides, but pointed out that the same principles hold true in the case of insecticides, with this exception: "However, the general use of the various insecticides will await a set of conditions bordering on an emergency. Farmers are not likely to invest heavily for insect control until it is obviously necessary to save a crop."

Speaking from the viewpoint of a farmer who has benefited from the use of agricultural chemicals, W. C. Barrie, farmer from Galt, Ontario, addressed the group. He said that "there is no crop that we grow on our 530-acre farm, that does not at some time or other require the use of chemicals to produce it economically. In fact, I am safe in saying that we could not farm today, were it not for the help we derive from using chemi-

cals of one kind or another."

Mr. Barrie mentioned specific examples of how the use of chemical products has brought profits and reduced labor. He said that systemic spraying has made "quite a difference in the growth and handling of crops." Before controlling weeds in this manner, he said, it was a task to dispose of weed seeds which came from the seed spout on the combine. "Now, it is easy," he reported.

Control of insect pests on livestock is a paying proposition, too. Mr. Barrie told the assembly. This had been a problem in years past, "but this year we found that by bringing our steers and cows in from the pasture once every three weeks and by spray-

CACA OFFICERS ELECTED

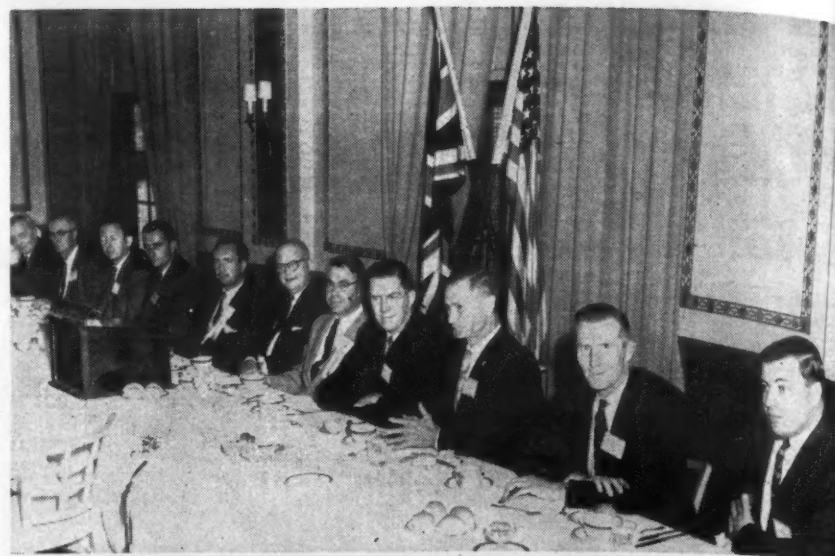
NIAGARA FALLS, ONT.—Officers elected at the fourth annual meeting of the Canadian Agricultural Chemicals Assn. were as follows: president, G. E. Willan, Niagara Brand Spray Co. Ltd., Burlington, Ont.; 1st vice president, A. W. Hutchison, Shell Oil Co. of Canada Ltd., Toronto, Ont.; 2nd vice president, M. E. Ward, DuPont Co. of Canada Ltd., Montreal, Que.; secretary, J. H. Elliott, Rohm & Haas Co. of Canada Ltd., West Hill, Ont., and treasurer, S. R. Stovel, North American Cyanamid Ltd., Toronto, Ont.

Directors were named as follows: R. G. Smith, Charles Albert Smith Ltd., Toronto, Ont.; D. D. Stokes, Monsanto Canada Ltd., Montreal, Que.; J. H. D. Ross, Chipman Chemicals Ltd., Hamilton, Ont.; P. E. Redman, National Grain Co. Ltd., Winnipeg, Man.; W. M. Karn, Electric Reduction Co. of Canada Ltd., Toronto, Ont., and W. H. Silversides, Interprovincial Co-Operatives Ltd., Winnipeg, Man.

ing them thoroughly . . . the flies were kept under control and the cattle were contented and made better gains than they had ever done before."

The use of fungicides in controlling wheat smut has been a life saver, the farmer declared. Former methods of control sometimes affected the germination, but now, through application of the newer materials, "we have never had a trace of stinking smut or bunt, and there is no danger of harming the germination."

The control of rats on the farm has been a real money-saver, the Ontario grower continued. The use



AT CANADIAN CONFERENCE—The fourth annual meeting of the Canadian Agricultural Chemicals Assn. held recently at Niagara Falls, Ont., drew important figures in the Canadian trade. Top photo shows head table at closing luncheon. From left to right, those seated at the table are: Dr. H. Martin, director, Science Service Laboratory, department of agriculture, London, Ont.; W. A. Thomson, president, Agricultural Institute of Canada, Ont.; M. E. Ward, DuPont Co. of Canada; W. Newman, farmer panelist, Pickering, Ont.; A. W. Hutchison, Shell Oil Co. of Canada; Stanley Jones, speaker and president, Winnipeg Grain Exchange; Ramsay Smith, retiring president, C.A.C.A.; W. C. Barrie, farmer panelist, Galt, Ont.; S. R. Stovel, North American Cyanamid Co., Ltd.; and J. H. Elliott, Rohm & Haas Co. of Canada, Ltd.

In the lower photo, Ramsay G. Smith, president, reports to the delegates. Mr. Smith is associated with Charles Albert Smith, Ltd. Seated is J. H. Elliott, treasurer of the association.

of modern methods of control has been very successful, whereas shooting and trapping the rodents "just seem to encourage them to increase in number." He added, however, that a broadscale campaign is necessary to gain best results.

Stanley N. Jones, president of the Winnipeg Grain Exchange, emphasized that the Dominion of Canada is no longer divided between an "industrial east" and an "agricultural west." Agriculture is a business which is important in all sections of the country, he declared. As business men, he reasoned, farmers are generally willing to try new methods to cut costs and increase output, "which is, in any line of business, one of the important elements of national prosperity."

"In assessing farming as a business and the size of farm necessary or required to carry out the operations of that business, it must follow that the same rules will apply as used in connection with other businesses, that is the efficiency with which the land, the capital invested, and the farmers' labor, is converted into produce for sale. The best size of farm, of course, is the size which permits the farmer to produce the lowest cost per unit.

"There is no indication so far that there is a trend toward excessively large farms on the prairies, as evidenced by the fact that between 1946 and 1951, Saskatchewan farms of 640 acres and more increased by 4,000 and in Alberta by something just over 6,000, while 1951 statistics show that farms of 480 acres and more increased from 79,000 to 90,000, while less than 480 acre holdings decreased from 221,000 to 181,000. There is defi-

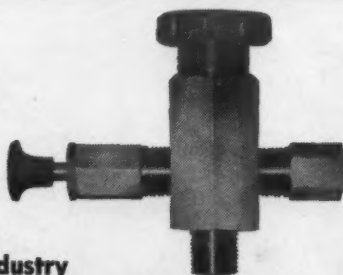
nately a tendency for farms to grow larger, but most of this increase in individually held acreage can be accounted for by the development of new machines and new techniques, which make it possible for one man to farm at least a half-section when previously a quarter section kept him busy.

"In assessing the place of grain growing, the area of concern, in the Canadian economy, one must conclude that in every respect but one, this industry, if not a leader in the trend, is certainly following the path of all other industry in this country. It is enlarging the unit size, it is doing a good production job—but in the most critical field, marketing, there is lamentable failure, as evidenced by the surplus situation which confronts us," he added.

Nitrogen Division Names New Sales Supervisor

NEW YORK—Isaac Swisher has been named sales supervisor, direct application materials, in the Illinois district, it has been announced by Nitrogen Division, Allied Chemical and Dye Corp. The promotion became effective November 1.

Before assuming his new position, Mr. Swisher was in charge of Arcadian 12-12-12 sales in the Midwestern area. He has been with Nitrogen Division for three and a half years. Mr. Swisher was graduated from Potomac State College, Keyser, W.Va., and later received his master's degree in agronomy from West Virginia University. He will make his home in Indianapolis.

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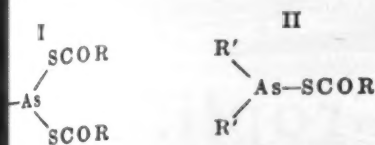
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INDUSTRY PATENTS

(Continued from page 7)

edient a member selected from the group consisting of



herein R' means a member selected from the group consisting of lower alkyl and phenyl, and R means a member selected from the group consisting of lower alkyl, phenyl and chlorophenyl.

2,767,115. Insecticidal Compositions
Chlorinated Turpentine Hydrocarbons and Methods of Stabilizing Same. Patent issued Oct. 16, 1956, to Homer Lyndale Schultz, Oberlin, and Robert R. Bloor, Lorain, Ohio, assignors to B. F. Goodrich Co., New York. In a method of stabilizing a chlorinated insecticide comprising a chlorinated mixture of camphene and hydrocarbon selected from the class consisting of alphapinene, beta-pinene, mixtures thereof, the step of adding up to about 5% by weight of an unchlorinated compound selected from the class consisting of alphapinene, beta-pinene, camphene and turpentine to said chlorinated mixture.

2,767,136. Process of Eliminating Arsenic Compounds from Phosphoric Acid. Patent issued Oct. 16, 1956, to Franz Rodis and Helmut Klee, Knapack, near Kilm, Germany, assignors to Knapsack-Griesheim Aktiengesellschaft, Knapsack-Bezirk, Kilm, Germany. A process of eliminating arsenic compounds from phosphoric acid by electrolysis, in which the electrolysis is carried out with a phosphoric acid which, at the commencement of the deposition, contains arsenic and copper in a proportion by weight ranging from between about 0.2 to about 1:about 5, and copper and iodine in a proportion by weight ranging from between about 0.06 to 40:3.0.

2,767,223. Production of Benzene Hexachloride Gamma Isomer Compositions. Patent issued Oct. 16, 1956, to Robert D. Donaldson, Wilmington, Del., and Ralph S. Park, Swarthmore, Pa., assignors to Allied Chemical & Dye Corp., New York. A process for the treatment of crude benzene hexachloride to obtain a material consisting essentially of the gamma isomer which comprises extracting a gamma-enriched crude benzene hexachloride with a selective solvent of the group consisting of the lower aliphatic alcohols containing from 1 to 3 carbon atoms and carbon tetrachloride, in an amount sufficient to dissolve practically all of the gamma isomer, but only a portion of the alpha and beta isomers, whereby there is formed an extract solution containing proportions of alpha and gamma isomers of the same order of magnitude, evaporating a quantity of solvent from the extract solution such that the resulting concentrated solution, when cooled, becomes saturated with respect to the alpha, beta and gamma isomers, cooling said hot concentrated solution in a confined zone completely closed from the surrounding atmosphere, from the boiling point of said solution rapidly over a period of from 1/2 to 3 hours with agitation to slow a temperature at which said solution is saturated with the alpha, beta and gamma isomers, but not below about 77° F., the rate of agitation being sufficient to permit crystallizing out a substantial portion of the gamma content of said solution without causing crystallization of the alpha and beta isomers, and to maintain a large number of the crystals formed in suspension throughout the body of liquor, promptly separating the crystals of gamma isomer substantially free from other benzene hexachloride isomers from the liquor

in the resulting mixture, subjecting the crystals so obtained to a first recrystallization by dissolving said crystals in the solvent-gamma isomer liquor from the hereinafter recited second recrystallization and cooling the resulting solution to recrystallize gamma isomer, subjecting partially purified gamma isomer crystals so obtained to a second recrystallization from a selective solvent to obtain pure odor-free gamma isomer product, the resulting solvent-gamma isomer liquor being recirculated to said first recrystallization and the solvent-gamma isomer liquor from said first recrystallization being combined with said solvent-gamma enriched crude benzene hexachloride extract solution prior to concentration thereof.

2,768,216. Thermal Dehydrochlorination of Benzene Hexachloride. Patent issued Oct. 23, 1956, to Fred W. Schmitz, Terre Haute, Ind., assignor to Commercial Solvents Corp., Terre Haute, Ind. The process which consists essentially in continuously passing a fluid mixture of benzene hexachloride and a liquid polychlorobenzene medium which is liquid at normal temperatures, consisting essentially of at least one liquid polychlorobenzene selected from the class consisting of trichloro- and dichlorobenzene, under a pressure of from about 2 to 10 atmospheres, to and through an elongated reaction zone heated to temperatures ranging from about 300° to 650° C. at a rate causing the liberation of approximately 3 moles of HCl per mole of benzene hexachloride, and continuously recovering the resulting polychlorobenzene product.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$25 must accompany each notice of opposition.

The trademarks below were published in the Oct. 23, 1956, issue of the Official Gazette of the U.S. Patent Office:

Blitz Fog, in hand-lettered caps and lower case, for liquid insecticide adapted to be sprayed over foliage in the form of a mist from an apparatus attached to an internal combustion engine. Filed May 17, 1955, by Northern Industries, Inc., doing business as the Blitz Fog Co., Milwaukee, Wis. First use, January, 1953.

Dylox, in capital letters, for insecticides. Filed Nov. 21, 1955, by Chemagro Corp., New York. First use, Nov. 10, 1955.

Kelthane, in capital letters, for insecticides, fungicides and disinfectants. Filed Nov. 29, 1955, by Rohm & Haas Co., Philadelphia, Pa. First use, Nov. 16, 1955.

Muscatox, in capital letters, for agents for combatting flies. Filed Dec. 19, 1955, by Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany.

Horse & Lion, in capital letters, for urea fertilizer. Filed Sept. 30, 1954, by Badische Anilin & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany. First use, Aug. 17, 1954.

Solu-Bone, in capital letters, for fertilizer. Filed April 12, 1956, by Stauffer Chemical Co., San Francisco, Cal. First use, Jan. 1, 1929.

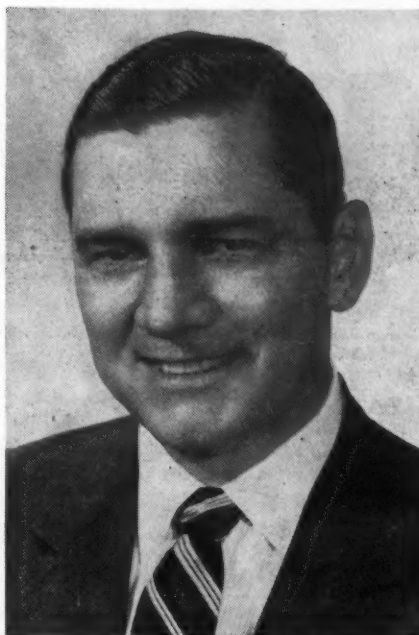
Gro-Life, in capital letters, for liquid fertilizer. Filed April 16, 1956, by Tibbetts Industries, Inc., Camden, Maine. First use, March 14, 1956.

Terroganic, in caps and lower case, for organic fertilizer. Filed May 8, 1956, by The Terre Co., Rochelle Park, N.J. First use, March 18, 1955.

The trademarks below were published in the Oct. 30, 1956 issue of the Official Gazette of the U.S. Patent Office:

Penta Plus 40, in capital letters, for wood preservatives and fungicides. Filed Dec. 22, 1955, by Chapman Chemical Co., Memphis, Tenn. First use, Dec. 1, 1955.

Lin-Cal, in capital letters, for fertilizer. Filed June 7, 1956, by C. B. Fox Co., New Orleans, La. First use, March 22, 1956.



James J. Rose



William N. Henderson, Jr.

Southern Nitrogen Co.
Names Representatives

SAVANNAH, GA. — Southern Nitrogen Co. has announced the appointments of two sales representatives who will operate in southern territories.

William N. Henderson, Jr., has been assigned to cover the state of South Carolina, and James J. Rose, the state of Florida, according to the company.

Mr. Henderson, a native of South Carolina, holds a degree in agronomy from Clemson Agricultural College and for the past nine years was manager of the Piedmont Fertilizer Corporation at Greenwood, S.C. Before that, he was associated with the Edisto branch of the South Carolina Agricultural Experiment Station. He

makes his home in Greenwood.

Mr. Rose is a native of Kentucky and holds a degree in horticulture from the University of Kentucky. His background is one of broad acquaintance with the fertilizer industry, having worked with the Kentucky feed and fertilizer department's regulatory service, Virginia-Carolina Chemical Corp. and Allied Chemical & Dye Corp. He will make his headquarters in Tampa, Fla.

NPFI MEETING DATES SET

WASHINGTON, D.C. — The National Plant Food Institute has set the dates for its 1957 annual convention as June 9-12. Place of the meeting will be the Greenbrier Hotel, White Sulphur Springs, W. Va., where the group has met for many years previously.

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Croplife

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Midwestern states.

Safety in Fertilizer Plants Well Worthwhile

Greater attention to the safe operation of its plants is a matter which should not be put off to a later time in the fertilizer industry. The increasing complexity of the manufacturing end of the trade calls for stepped-up supervision over both men and machines in the plant to reduce the number of accidents that happen with too much regularity in some places.

The recent meeting of the fertilizer section of the National Safety Council in Chicago brought forth some comment along this line as comparisons were made between conditions now existing in some of the plants, and the way things were before organized efforts were made to prevent accidents. Not only from the speakers' platform were testimonials given as to the effectiveness of putting safety to work, but also in private conversation in the hotel's halls and luncheon tables as well. Many comments were made, with the dismal accident records in plants during bygone days, being contrasted to current conditions in which lost-time accidents are actually a rarity.

Unfortunately, these glowing reports come from only a relatively few plants around the country. But the fact that progress has been made so well in many places, is certainly an indication that it can do just as remarkable a job in other situations also. The size of the plant seems to make little difference in the extent of accomplishments in the way of safety promotion, since both large and small ones have come up with impressive improvements.

Probably one of the most important considerations in doing a good safety job in any given plant, is the realization that the job can't be done very effectively by a single plant alone. The job is so large, encompassing as it does, both human elements and mechanical and engineering considerations, that some degree of outside help is needed . . . assistance of the kind rendered by the National Safety Council. In other words, joining the fertilizer safety section of the Council is a big step toward helping yourself to its long experience and know-how in cutting down plant accidents!

One speaker at the Chicago meeting, C. S. Griffith, superintendent of Virginia-Carolina Chemical Corporation's plant at Cincinnati, Ohio, told the conventioners that the great improvement in his plant's safety record dates back to the time his organization joined the Council and began using its suggestions regarding ways to conduct safety meetings effectively. As a result, he said, the past four years have been "the safest years we have ever experienced." The information and inspiration gained at safety meetings of the NSC, plus their aid in solving problems, did the trick, he declared.

In fact, Mr. Griffith reported that his plant had made attempts to improve its safety record, but with little result until membership in the national group was acquired. Before that time, he said, safety meetings appeared to be without direction, and finally deteriorated to sessions comprising idle talk, wrangling, and killing time. The safety committee, he said, was composed of a "gang of men who were more interested in getting out of work to attend a meeting, than in the safety of their fellow workers." Because of this attitude, the accident record grew worse and all kinds of excuses were made for it, including the plea that the plant was "jinxed," or "unlucky."

Since that time, conditions in Mr. Griffith's plant have made giant strides toward safety, and now even the workmen are enthusiastic over the safety record and are active in providing slogans and other suggestions toward keeping all mishaps at the lowest minimum.

Part of Mr. Griffith's talk could well sum up

any discussion of how safety must be conducted in any plant. "Safety is not a one-man job," he insisted. "Neither is it just the job of management. It's not just the job of the men in the plant. It's not the job of a few foremen. It is the full time job of every one of us . . . preaching, talking and living safety. There can be no letdown in safety; it's too important!"

When one considers the many sources of hazards in fertilizer plants, he realizes how fundamental must be the studies in safety. Danger from acids and other chemicals; from electrical equipment; from conveyor belts, screw conveyors, and motorized vehicles within the plant; fires; gears on dryers and granulators; falls on dust-coated steps; overhangs in bins; dynamiting of stored materials within building; and moving of railroad cars on sidetracks, just to mention some of the more obvious hazards that confront fertilizer manufacturing personnel.

Actually, membership in the National Safety Council does not represent a large cash outlay at all. The benefits are great, since not only is the cost of accidents reduced, but the by-products of improved employee morale, more efficiency, attracting a better grade of workers, and an improvement in community relations, are all a part of the over all betterment.

Cost of membership in NSC is very likely to be more than repaid over a period of years, by reduced workmen's compensation insurance premiums and even rebates from insurance companies, if the record of accident reduction is impressive enough. It has been done in the trade and will continue as the safety movement spreads.

Scarcely anyone can go to an industry safety meeting of the type just concluded in Chicago, without coming away holding the conviction that safety is an increasingly important matter in the fertilizer business. The testimony of many who have succeeded in their safety programs is eloquent. It indicates that safety-mindedness in the fertilizer industry pays great dividends.

As Mr. Griffith declared at the meeting, "you can insert safety anywhere or at any time into your lineup, and it will improve the entire team." Our hope is that many additional fertilizer firms will do just that.

Plant Food Bargains Continue

"Fertilizer prices per ton have advanced 50% since 1939 but at the same time plant food concentration has increased by about 36% thus largely offsetting the per ton price increases. The net increase in the price of fertilizer on a plant food content basis is only about 10% in 16 years. Prices of all items farmers buy have risen thirteen times as much in the same period. Prices of farm products, according to the U.S. Department of Agriculture, today stand at 260% of their 1939 level. In other words, the same amount of plant food it took to produce \$1 worth of farm products in 1939 will today produce \$2.60 worth of farm products. In view of the mere 10% rise in plant food prices, it is today a fact that a dollar's worth of fertilizer is worth almost two and one half times as much to the farmer as it was in 1939." —W. R. Allstetter, vice president, National Plant Food Institute, in an address at the annual meeting of the National Nitrogen Solutions Assn.

Quote

"When you get right down to fine points, the biggest factors in agriculture are the faith and courage of farmers, and it isn't likely that any government farm program will ever displace them in our system. In other systems of government, fear and slavery are substituted for faith and courage. Maybe our way doesn't guarantee security under all conditions, but it does leave room for a man to be a man and that surely is more to be desired than any other thing a government can give."—Editorial in "Arizona Farmer" magazine.



Croplife



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG

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DONALD NETH

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MEETING MEMOS

Oct. 2-4—Eleventh annual Beltwide Cotton Mechanization Conference, Shreveport, La.

Dec. 13-14—Ohio Fertilizer and Lime Conference, State Office Building, Columbus, Ohio.

1957

Jan. 15-16—Nebraska Fertilizer Institute, Inc., College of Agriculture, University of Nebraska, Lincoln. Howard W. Elm, 917 Trust Bldg., Lincoln, Neb., executive secretary.

Mar. 4-5—Western Cotton Production Conference for 1957, Westward Ho Hotel, Phoenix, Ariz.

June 9-12—National Plant Food Institute, annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

EDITOR'S NOTE: Listings above are appearing in this column for the first time this week.

Nov. 11-13—California Fertilizer Assn., 33rd annual convention, Del Coronado Hotel, Coronado, Cal.; Sidney H. Bierly, executive secretary, 475 Huntington Drive, San Marino 9, Cal.

Nov. 12-14—Oregon Weed Conference, Pilot Butte Inn., Bend, Ore.

Nov. 12-16—American Society of Agronomy, Annual Meeting, Netherlands Plaza Hotel, Cincinnati.

Nov. 13-15—18th Annual New York State Insecticide and Fungicide Conference and 9th Annual Pesticide Application Equipment Conference, Bibbins Hall, Cornell University, Ithaca, N.Y.

Nov. 15-16—Washington State College Weed Conference, Pullman, Wash.

Nov. 16—Arkansas Fertilizer School, Sponsored by University of Arkansas and Plant Food Educational Society of Arkansas, Marion Hotel, Little Rock.

Nov. 19-20—Eastern Branch, Entomological Society of America, Hotel Haddon Hall, Atlantic City, N. J., B. F. Driggers, Rutgers University, New Brunswick, N.J., secretary.

Nov. 19-20—Ohio Pesticide Institute winter meeting, Neal House, Columbus, Ohio.

Nov. 27-28—Indiana Fertilizer Conference, Memorial Union, Purdue University, Lafayette, Ind.

Nov. 28—Oklahoma Fertilizer Dealers Conference, Sponsored by the Oklahoma Plant Food Educational Society, Oklahoma A&M College, Stillwater.

Nov. 29—Oklahoma Soils and Crops Conference, Oklahoma A&M College, Stillwater.

Nov. 29—New Jersey Pesticide Dealers Conference, Rutgers University, New Brunswick, N.J.

Nov. 29-Dec. 1—Washington State College Ground Applicators Short Course, Puyallup, Wash.

Nov. 30—Seventh Annual South Dakota Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Dec. 3—Sixth Annual Minnesota Soils and Fertilizer Short Course, Coffey Hall Auditorium, St. Paul Campus, University of Minnesota.

Dec. 6-7—Alabama Soil Fertility Society, Whitley Hotel, Montgomery, Ala.

Dec. 10-12—13th Annual North Central Weed Control Conference, Sherman Hotel, Chicago.

Dec. 12—American Society of Agricultural Engineers, Power and Machinery Section, in Cooperation with the National Joint Commit-

tee on Fertilizer Application, Edgewater Beach Hotel, Chicago.

Dec. 13-14—Soil Fertility and Plant Nutrition Short Course, University of Missouri, Columbia, Mo.

Dec. 13-14—Cotton Production Conference, The Titwiler, Birmingham, Ala.

Dec. 27-31—Entomological Society of America, Annual Meeting, Hotel New Yorker, New York City.

1957

Jan. 8-9—Texas Fertilizer Conference, Texas A&M, College Station, Texas.

Jan. 9-10—Eleventh Annual Wisconsin Insect Control Conference, Sponsored by the Entomology Dept., University of Wisconsin, Lorraine Hotel, Madison, Wis.

Jan. 10-12—Northeastern Weed Control Conference, McAlpin Hotel, New York.

Jan. 21-25—Pacific Northwest Vegetable Insect Conference and Northwest Cooperative Spray Project, Imperial Hotel, Portland, Ore.

Jan. 23-24—Fourth Annual Pacific Northwest Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore., Sponsored by Western Agricultural Chemicals Assn., C. O. Barnard, 2466 Kenwood Ave., San Jose 28, Cal., Executive Secretary.

Jan. 23-25—Southern Weed Conference, Bon Aire Hotel, Augusta, Ga.; Walter K. Porter, Jr., Agricultural Experiment Station, Louisiana State University, Baton Rouge, secretary.

Jan. 28-29—National Cotton Council of America, Annual Meeting, St. Louis, Mo.

Jan. 31-Feb. 1-2—Agricultural Aircraft Assn., Annual Convention, Senator Hotel, Sacramento, Cal., Wanda Branstetter, Route 3, Box 1077, Sacramento, Executive Secretary.

Feb. 4-6—Cotton States Branch, Entomological Society of America, Birmingham, Ala. W. G. Eden, secretary-treasurer, Alabama Polytechnic Institute, Auburn, Ala.

Feb. 19-20—Alabama Pest Control Conference and First Annual Meeting of the Alabama Association for the Control of Economic Pests, Auburn, Ala., W. G. Eden, Alabama Polytechnic Institute, Auburn, secretary-treasurer.

March 6-8—National Agricultural Chemicals Assn., Spring Meeting, Fairmont Hotel, San Francisco, L. S. Hitchner, 1145 19th St. N.W., Washington, D.C., Executive Secretary.

June 17-19—Fifteenth Annual Convention of the Association of Southern Feed and Fertilizer Control Officials, Dinkler-Tutwiler Hotel, Birmingham, Ala., Bruce Poundstone, Kentucky Agricultural Experiment Station, Lexington, Ky., Secretary-Treasurer.

June 26-28—Eighth Annual Fertilizer Conference of the Pacific Northwest, Benson Hotel, Portland, Ore. B. R. Bertramson, Washington State College, Pullman, Wash., chairman.

July 17-19—Southwestern Fertilizer Conference and Grade Hearing, Galvaz Hotel, Galveston, Texas.

CARL R. BYERS DIES

WESTFIELD, N.J.—Carl R. Byers, 69, retired chief agronomist at Armour & Co. fertilizer plant at Carteret, N.J., died of a heart attack Oct. 26 at his home here. He retired from active duty with Armour two years ago.

OXIDES

(Continued from page 18)

astic response to a proposal favored 18 to 1 among agronomists!

Experiment station personnel, however, need not implement legislation nor administer it when it becomes law, and this, I believe, accounts for the disparity of response. Whenever laws are opened for change, vulnerability puts in an appearance because the opponents to change have their counterbalances in the form of riders or other legislation. This could result in adoption of new provisions of the fertilizer laws, which would cause hardship for the legitimate manufacturer, and by the same token it could also create new enforcement problems for you, or both.

Thus I earnestly hope that this group of control officials will not become crusaders until a more thorough study has been made, and will wait until all sources are heard from before taking any further action. There are too many important and vitally interested sources not yet even contacted. There may not be nearly the unanimity of opinion within your own organization that should prevail. Individual, uncoordinated legislative action can result only in chaos for the plant food industry and bedlam in inspection and control procedures.

Meanwhile, let us work together in truly constructive developments occasioned by the advances of the technology of our industry—for example, we have the problem of sampling methods and tolerance establishment under increasing granulation, to solve. We are also faced with analytical and quality control procedures. Then we have the troublesome problem of protection of manufacturer and consumer alike from the fly-by-nighters and "miracle-workers."

The technological road ever lengthens on mutual problems. Together we can realize the progress which is indicated in all the tomorrows of our industry.

But—as for consideration of legislation to change the oxides to elements, let me borrow a phrase that is always heard before elections: "Let's wait until all the returns are in and make sure all the precincts are counted."

BERRY GROWERS TO MEET

ST. PAUL—The tenth annual short course for berry growers will be held at the University of Minnesota's Institute of Agriculture Nov. 28.

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Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge \$2.25. Situations wanted, 10¢ a word; \$1.50 minimum. Count six words of signature, whether for direct reply or keyed care of this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding reply. Classified advertising rate not available for commercial advertising. Advertisements of new machinery, products and services accepted for insertion at minimum rate of \$9 per column inch. All Want Ads cash with order.

MACHINERY FOR SALE

FOR SALE—THREE 6,000-GALLON HIGH pressure tanks; one 30,000-gallon tank with manhole, suitable for anhydrous ammonia or propane. Nebraska Fertilizer Co., Box 471, Falls City, Neb., or Phone 6699, Falls City, Neb.

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"SALESMEN WANTED FOR AGRICULTURAL CHEMICALS"

Established producer is expanding, and has available key territories for sales to Fertilizer Manufacturers. Require aggressive, ambitious men for outstanding opportunities handling ammonium nitrate and nitrogen solutions. Salary based on experience. Employment benefits and car provided. Send confidential replies including age, background, and salary requirements to Ad No. 2160, Crop-life, Suite 3214, 551 Fifth Ave., New York 17, N.Y.

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We are nearing construction completion of our 75% Phosphoric Acid Unit and Ammonium Phosphate soluble pelleted fertilizer plant at Tulsa.

We have unfilled positions open in our credit, secretarial, sales clerical, sales and distribution work. We are seeking seasoned, experienced people for these jobs.

If interested please contact Dan Ellis, The Ozark-Mahoning Company, P. O. Box 449, Tulsa 1, Oklahoma.

NITROGEN RECOMMENDED

MANHATTAN, KANSAS — L. E. Willoughby, Kansas State College crops specialist, suggested to farmers on a recent Pawnee County tour that they use heavy applications of nitrogen in irrigation-produced crops such as sorghums. He suggested 150 lb. or more of actual nitrogen per acre per year if 100-bu. yields are expected.

See why you get better ammoniation



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Look at a particle of V-C Triple Superphosphate under a microscope and you quickly see why you get better ammoniation with this quality product. Magnified many times, the "natural" texture of each tiny particle looks like a sponge or a honeycomb. This means more surface area for faster, easier and more efficient ammoniation.

The "natural" texture of V-C Triple Superphosphate is the result of a superior V-C method of natural drying. Another advantage of V-C processing is a lower-than-average fluorine content which decreases the possibility of reversion in ammoniation. Quality is the watchword at the big, new, modern V-C Triple Superphosphate plant

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- 46% Granulated Triple Superphosphate in Your Bags

You know you can depend on V-C for SUPER quality and SUPER service. Why be satisfied with less than the best! See V-C today!

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